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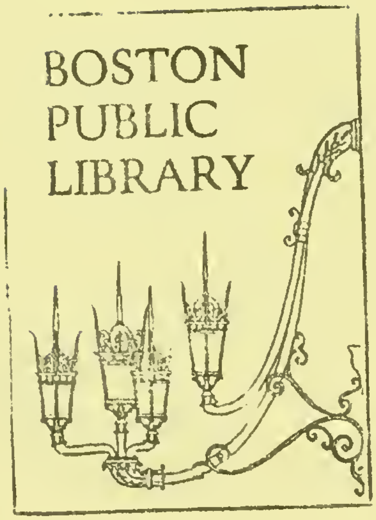

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Feasibility Study

Huntington Place
Boston, Massachusetts

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Note Foldouts

Prepared by
Hugh Stubbins & Associates, Inc.

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2 SEPT 1978

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June 27, 1978

Mr. Clare M. Cotton, President
The Boston-Fenway Program, Inc.
236 Huntington Avenue
Boston, MA 02115

Dear Mr. Cotton:

We are pleased to submit the enclosed Huntington Place Feasibility Study for your review. The study is intended to define existing and proposed site conditions, enumerate development options, recommend a Site Development Plan, and identify probable construction costs for the entire project.

The study also includes descriptions of anticipated soil conditions, proposed foundation and structural systems, and recommended mechanical, electrical, and plumbing systems. In addition, a traffic and circulation report is included.

We wish to express our appreciation for the invaluable assistance provided by The Boston-Fenway Program, Inc. and by the participating member institutions: Wentworth Institute of Technology, The Museum of Fine Arts and Northeastern University.

We trust this document will assist your organization and the three member institutions in reaching a decision regarding Phase II - the design and construction of Huntington Place.

Very truly yours,

HUGH STUBBINS AND ASSOCIATES, INC.

Richard Green, AIA
Vice President/Design

RG/kga

Enclosures

TWX 710-320-1720 STUBBINS CAM

Feasibility Study

Huntington Place

Boston, Massachusetts

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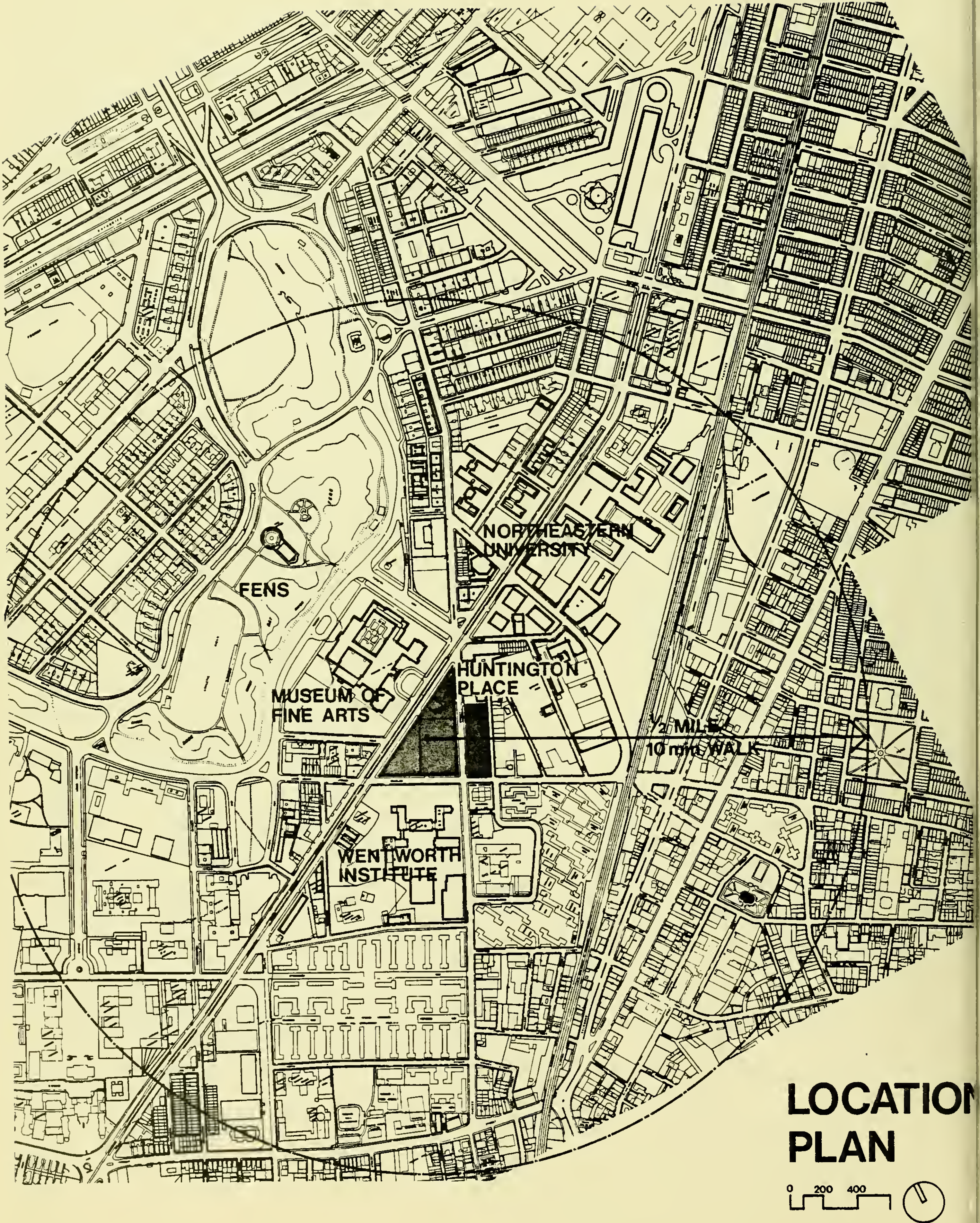
I. Introduction



LOCATIO PLAN

OVERVIEW

The Fenway area of Boston, Massachusetts represents a changing, constantly evolving microcosm of all the forces, pressures, aspirations, shortcomings, and potential opportunities of the process of urbanization in the United States today. In addition to the several different, identifiable residential communities and neighborhoods, and the supporting cultural and commercial amenities, seventy-seven institutions are located within the 900 acre area referred to as the Fenway. The juxtaposition of the long range goals and objectives of these institutions, with the immediate, day to day concerns of the area's residents, has resulted in a very special section of the city, united by objectives and concerns uniquely its own and evidenced by a diverse, yet common character and spirit. The social and economic pressure for sensitive, evolutionary change within this area has been well-articulated and must be accomplished within a framework consistent with the goals and objectives of all the individual groups that, together, comprise the Fenway.

Although the open space parkland of the Back Bay Fens and the general character of the entire Fenway area represents unparalleled potential as an in-town living and working environment, the recent history of the area has shown a marked decline in overall quality. Unfortunately, security problems, a rash of fires of suspicious origin, and a general increase in all types of crime, have contributed to focus the attention of the city on the Fenway in a less than positive manner.

Within this context and with a spirit of collective concern and enthusiasm, Wentworth Institute of Technology, the Museum of Fine Arts, and Northeastern University have jointly requested The Boston-Fenway Program, Inc., an organization with a membership comprised of 12 institutions in the Fenway area, to undertake an analysis of the needs of the three member institutions and to examine the potential to develop a major 5.4 acre site located on Huntington Avenue adjacent to the three institutions. In turn, The Boston-Fenway Program, Inc., has retained the services of Hugh Stubbins and Associates, Inc., Architects and Planners, to conduct this feasibility study.

MEMBER INSTITUTIONS

All three of the member institutions have developed long range cultural and educational goals and corresponding facilities Master Plans to accomplish these objectives.

Wentworth Institute of Technology, a 2,200 student educational institution, has both 2 and 4 year degree granting programs in the engineering technology disciplines. At the present time, the 9.7 acre campus is comprised of 11 academic buildings, residential facilities for 723 students, and parking for 1,039 cars. The physical organization of the campus focuses on an academic core located between Ruggles, Parker, and Ward Streets, with residential facilities on Huntington Avenue and Evans Way to the west.

Wentworth has defined the need to replace sub-standard student housing units and to construct new residential facilities. In the years ahead, as the number of high school graduates declines, competition to attract qualified students will become more intense and the ability to house these students in appropriate student housing facilities will become extremely important. In addition, to assist in attracting new students to Wentworth, Dr. Edward T. Kirkpatrick, President of Wentworth Institute, has articulated a strong desire on the part of the institution to create a new focus for the campus and to improve its overall image.

The Museum of Fine Arts, recognized as one of the leading cultural institutions in the world, has developed long range goals to provide new programs and corresponding facilities to increase the annual number of visitors from 505,000 in 1977, to 1,000,000 - 1,500,000 by 1981. In order to meet this goal, a major facilities renovation is underway to provide more appropriate environmental systems for the Museum, to more efficiently utilize existing space, and to add an 80,000 SF addition to the southwest towards Museum Road. This expansion program will provide a new arrival and parking area, entered from Museum Road, as well as a new entrance to the Museum and much needed auditorium and gallery space. The result of this expansion will reduce on site parking facilities, for Museum visitors and staff, from 430 to approximately 260.

Northeastern University, a major cooperative educational institution, has a current enrollment of 11,000 full-time day students and 4,500 part-time evening students. The 50 acre Boston campus provides housing for 2,700 students and parking for 2,804 cars. The physical plan of the Boston campus is the result of a 1934 architectural competition that established the classical modern style of architecture with the academic core buildings clustered around the main quadrangle on Huntington Avenue. During the 1960's, Northeastern expanded its physical plant on both sides of Huntington Avenue and presently, the campus is organized in three major zones: the academic core on Huntington Avenue, housing and parking to the northwest, and a major parking area southwest of this academic core.

As one of its long term goals, the University has stated a desire to maintain approximately the same student enrollment in a time of enrollment stability and potential future decline in admissions applications. The Northeastern Admissions Department presently requires approximately 1,700 housing accomodations for new students each year. With this number reserved for new students, the University is not able to adequately house its returning students. A total residential facilities requirement for 4,000 students has been defined in the Campus Master Plan Report of November 1, 1976.

At the present time, Northeastern's parking facilities consist of 15 open parking areas with a combined capacity of 2,804 cars. Although the University has established a plan to reduce the dependence on the private automobile and, even though Mass Transit services in the area will be greatly improved in the near future, Northeastern still has a need to develop more land efficient structured parking facilities for a minimum of 1,000 cars, primarily to replace spaces that will be lost in conjunction with the southwest corridor development and other projects.

PROGRAM

In response to the needs of the three member institutions, the following program has been developed and is to be analyzed in this Feasibility Study.

1. Student Housing 600-800 beds
   The need to provide both new and replacement housing for Wentworth and Northeastern students has been defined. In addition, flexibility in the design of the units to provide 2 bedroom faculty apartments and to accomodate a small percentage of studio apartments is desired.

2. Commercial Space ±20,000 SF

The commercial component of the program was developed primarily to serve the on-site resident population and the student communities of both Wentworth and Northeastern. Specific uses may include a combined Wentworth/Northeastern bookstore and student supply store, a small restaurant, and a branch bank.

3. Parking 1,100 cars

The program for parking 1,100 cars has been developed to provide replacement parking for the three member institutions as follows:

a. Wentworth	300 spaces
b. Northeastern	400 spaces
c. Museum of Fine Arts	400 spaces

PRIORITIES

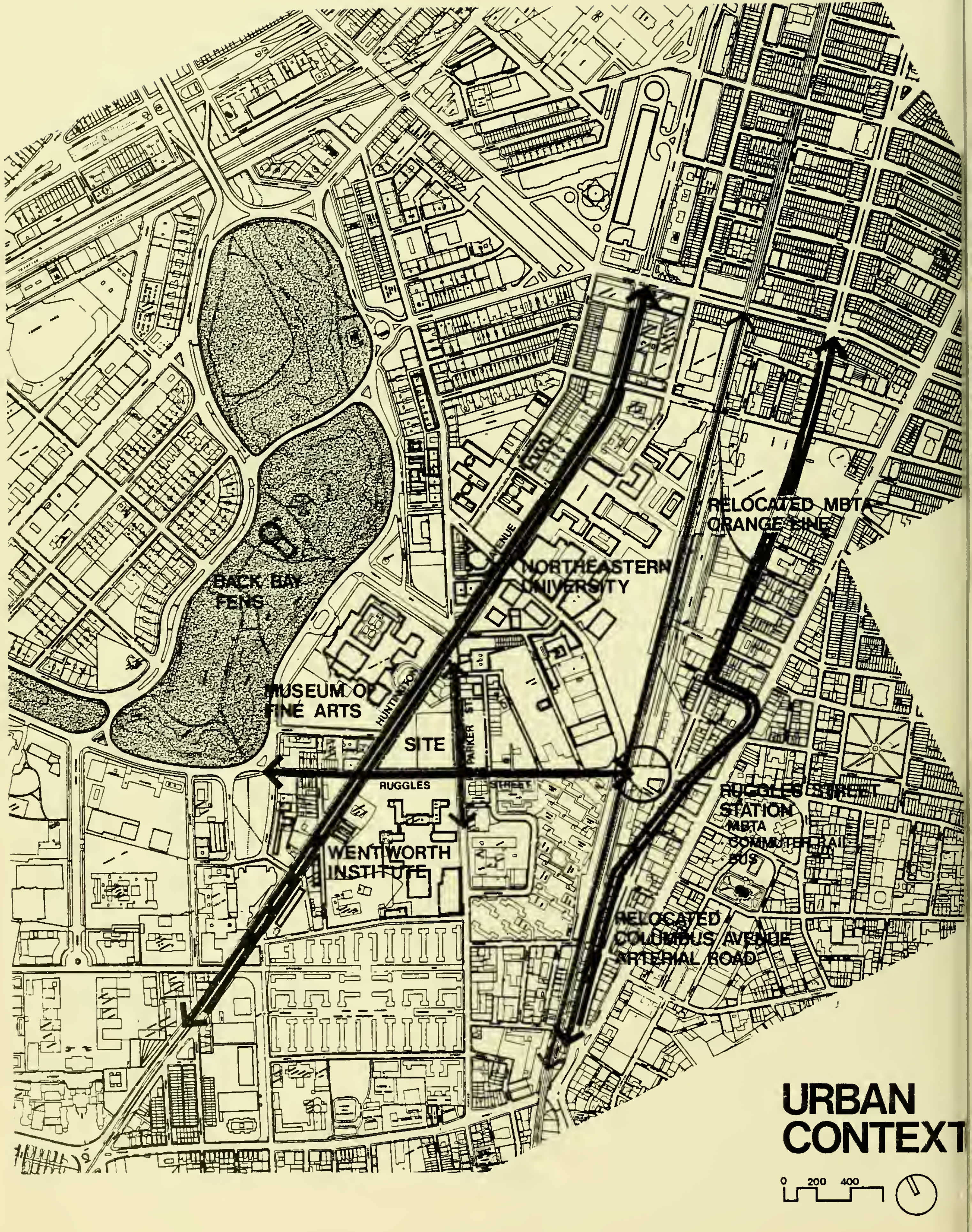
Based on the new attendance projections mentioned previously, the Museum of Fine Arts has defined a need to provide between 700 and 800 parking spaces for visitors and staff. As a result, the first parking garage increment of 710 spaces has been given top priority in the development of Huntington Place.

Following this immediate need for parking, the desire to provide housing accomodations for 600-800 students is the next highest priority.

The third level of development priority is the remaining 300-400 car garage and the potential of defining additional student housing and related commercial facilities.

II. Context Analysis

URBAN CONTEXT



URBAN CONTEXT

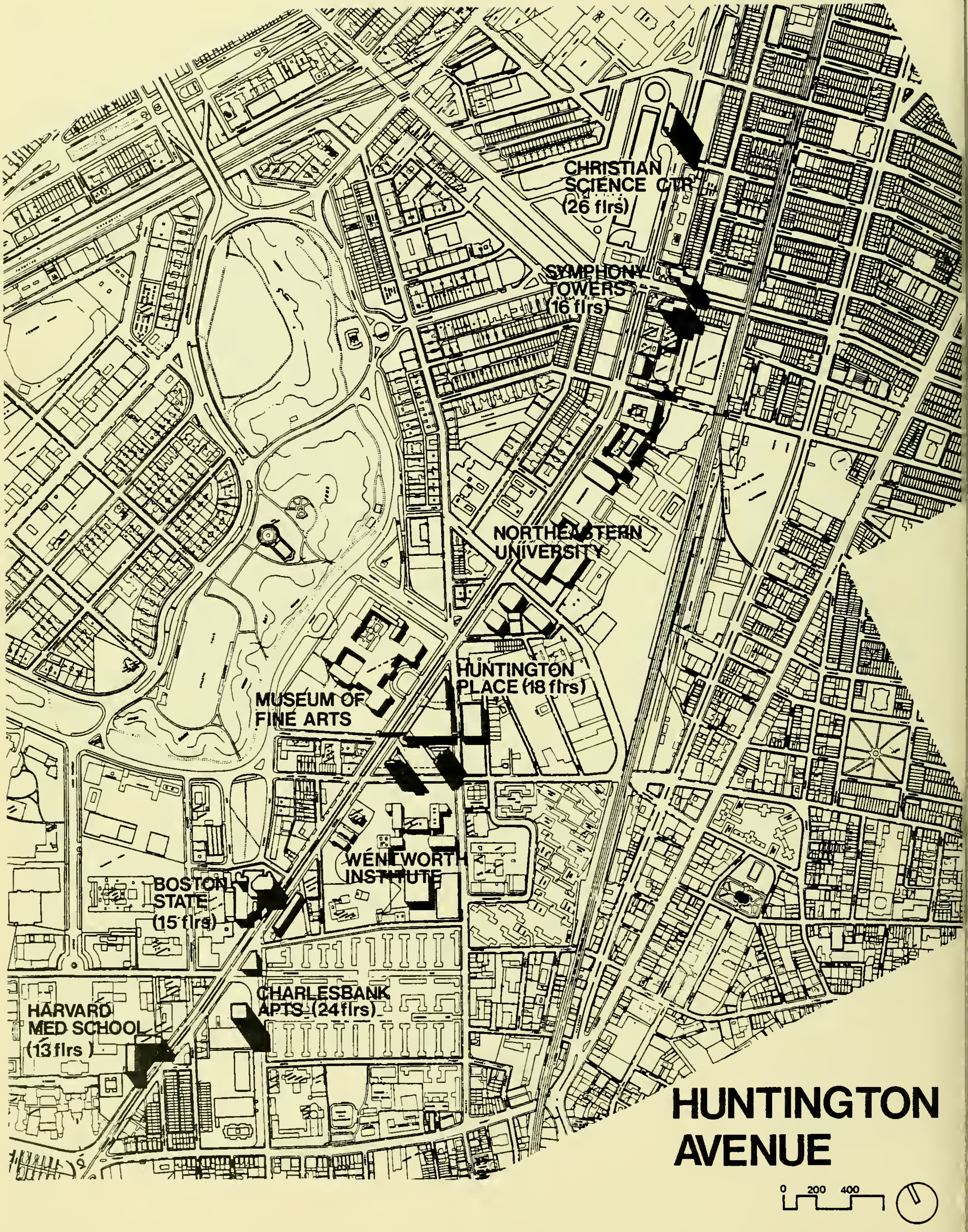
The Huntington Avenue Corridor from Massachusetts Avenue Southwest to the Medical Center Complex is characterized by a combination of institutional, residential, and commercial uses that has precipitated an urban fabric of varying grains and densities and, inconsistent building heights, massing and scale relationships. The continuity defined by this corridor, has been loosely established by the $4^1/_2$ to 6 story residential and institutional character which is punctuated at varying intervals by high rise towers of from 15 to 24 stories. The open space network generated by both Northeastern University and the Museum of Fine Arts is fairly well structured but the present condition of the Huntington Place site represents a major interruption in this Huntington Avenue fabric.

MOVEMENT

At the present time, the site is served by the Arborway Green Line MBTA surface rail transit system, located on Huntington Avenue. The Phase 2 Topics Program (Transportation Operations Program to Improve Capacity and Safety) scheduled to go out for bid in late 1978, is a major effort that will include the widening of Huntington Avenue, improved traffic signalization, and incorporates a new Green Line stop at the corner of Huntington Avenue and Ruggles Street.

The Southwest Corridor Development, a 4.7 mile, $689,000,000 transportation and development project scheduled for completion in 1983, will be located along the existing Penn Central Railroad right of way to the east of the Huntington Place site. The Orange Line MBTA system will be relocated to this corridor and a major intermodal transit station is proposed at Ruggles Street that will include the Orange Line Station, a commuter rail station and, a major MBTA bus facility. The Southwest Corridor Development Project also anticipates the construction of a four and six lane arterial road from Massachusetts Avenue to Jackson Square and possibly beyond to provide improved automobile access to the entire core area and the Southeast Expressway.

HUNTINGTON AVENUE


CHRISTIAN SCIENCE CTR (26 flrs)
SYMPHONY TOWERS (16 flrs)
NORTHEASTERN UNIVERSITY
HUNTINGTON PLACE (18 flrs)
MUSEUM OF FINE ARTS
WENTWORTH INSTITUTE
BOSTON STATE (15 flrs)
CHARLESBANK APTS (24 flrs)
HARVARD MED SCHOOL (13 flrs)
0
200
400

At the present time, Huntington Avenue serves as the major north-south vehicular route in the area while Ruggles Street provides an east-west connection from Roxbury to the Fens and beyond. The Andrews Station - Central Square bus route (Number 47) also provides accessibility to the site along Ruggles Street. Parker Street, although not a major arterial street now, may take on increased importance in the future as a result of the proposed Southwest Corridor Project.

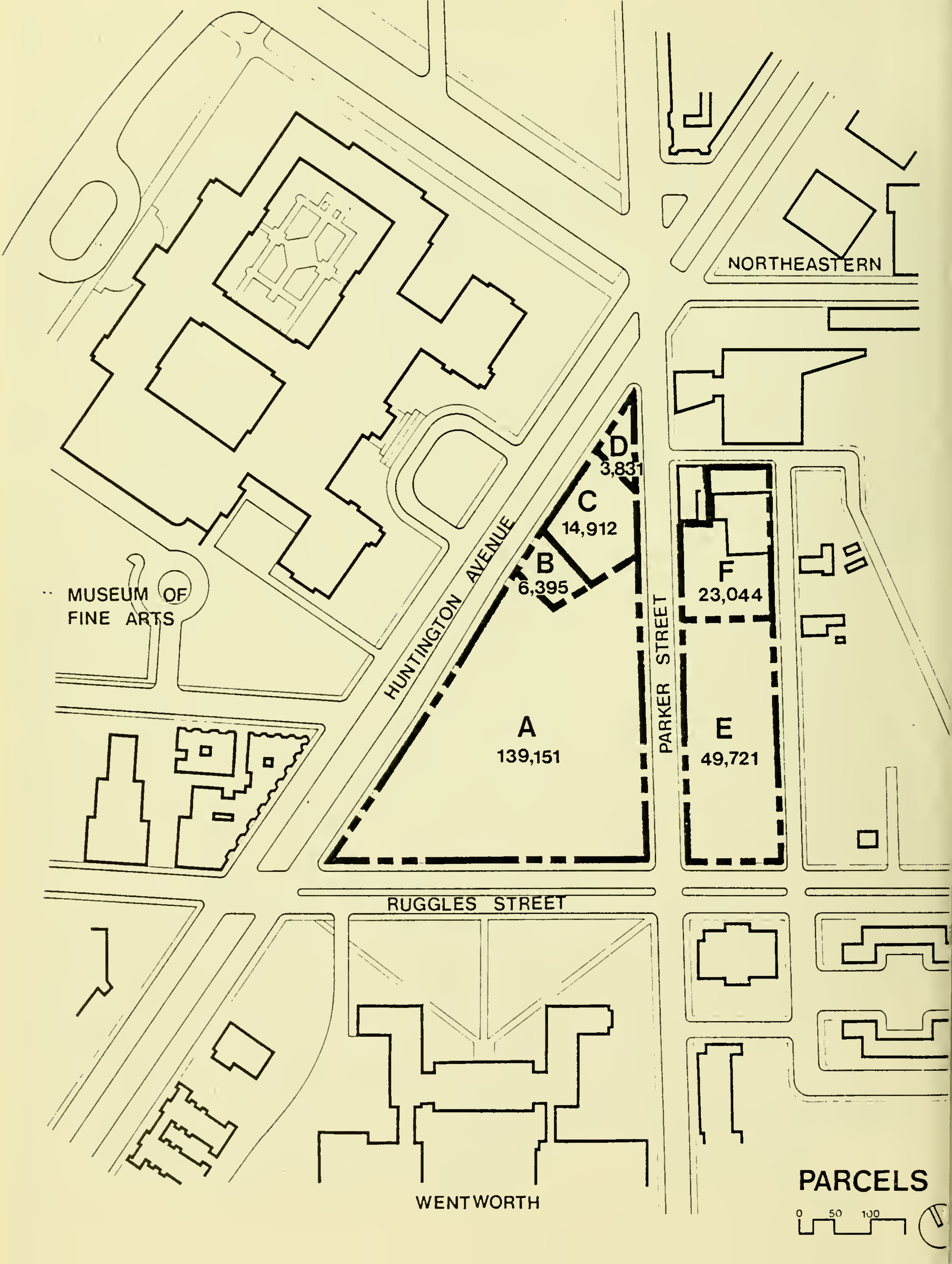
Parking in the immediate site area is problemmatic at present. Wentworth currently utilizes approximately 3.2 acres of the site to accommodate 247 cars. In addition, Northeastern uses the Commonwealth owned property on Parker Street for parking 110 cars. Pressure from surrounding residents, churches, and other groups in the area indicate the parking problem is significant and requires resolution.

Pedestrian circulation at the present time occurs along Huntington Avenue and from the Wentworth parking lot on the Huntington Place site across Ruggles Street to the institutes academic facilities. Upon completion of the Ruggles Street Transit Station and the new Green Line stop on Huntington Avenue, a more defined pedestrian circulation system will exist.

In addition, a "greenbelt connection" incorporating walkways, bicycle paths, jogging trails and active recreational areas is planned along Ruggles Street to link the Southwest Corridor Park to the Back Bay Fens and on to Franklin Park, the Arnold Arboretum, and indirectly to the Charles River, the Public Garden, and the Boston Common.

SITE

The specific site proposed for the development of Huntington Place is located on 4 parcels (A-D) forming a triangle and bounded by Huntington Avenue, Ruggles Street and Parker Street and comprises 164,289 SF. In addition, 2 parcels (E, F) are loated to the east of Parker Street and total 72,765 SF for a total project area of 237,054 SF. However, with the completion of the TOPICS Program that will widen Huntington Avenue and with the anticipated widening of Ruggles Street to provide 4 lanes of moving traffic plus one left turn/median strip lane, the site area will be reduced by approximately 17,855 SF and result in a total figure of 219,199 SF which will be utilized throughout this study.


NORTHEASTERN
MUSEUM OF FINE ARTS
HUNTINGTON AVENUE
PARKER STREET
RUGGLES STREET
WENTWORTH
D 3,831
C 14,912
B 6,395
A 139,151
F 23,044
E 49,721
PARCELS
0 50 100

The 6 parcels that comprise the Huntington Place site are owned by Wentworth, Northeastern, the Commonwealth of Massachusetts, and private individuals.

Present land use of the six parcels is as follows:

Parcel A: Wentworth parking for 247 cars plus limited recreational useage

Parcel B: Rubenstein Hall, Northeastern residences for 100 students.

Parcel C: Private housing comprising 72 units of which approximately $^{1}/_{2}$ are leased to Northeastern.

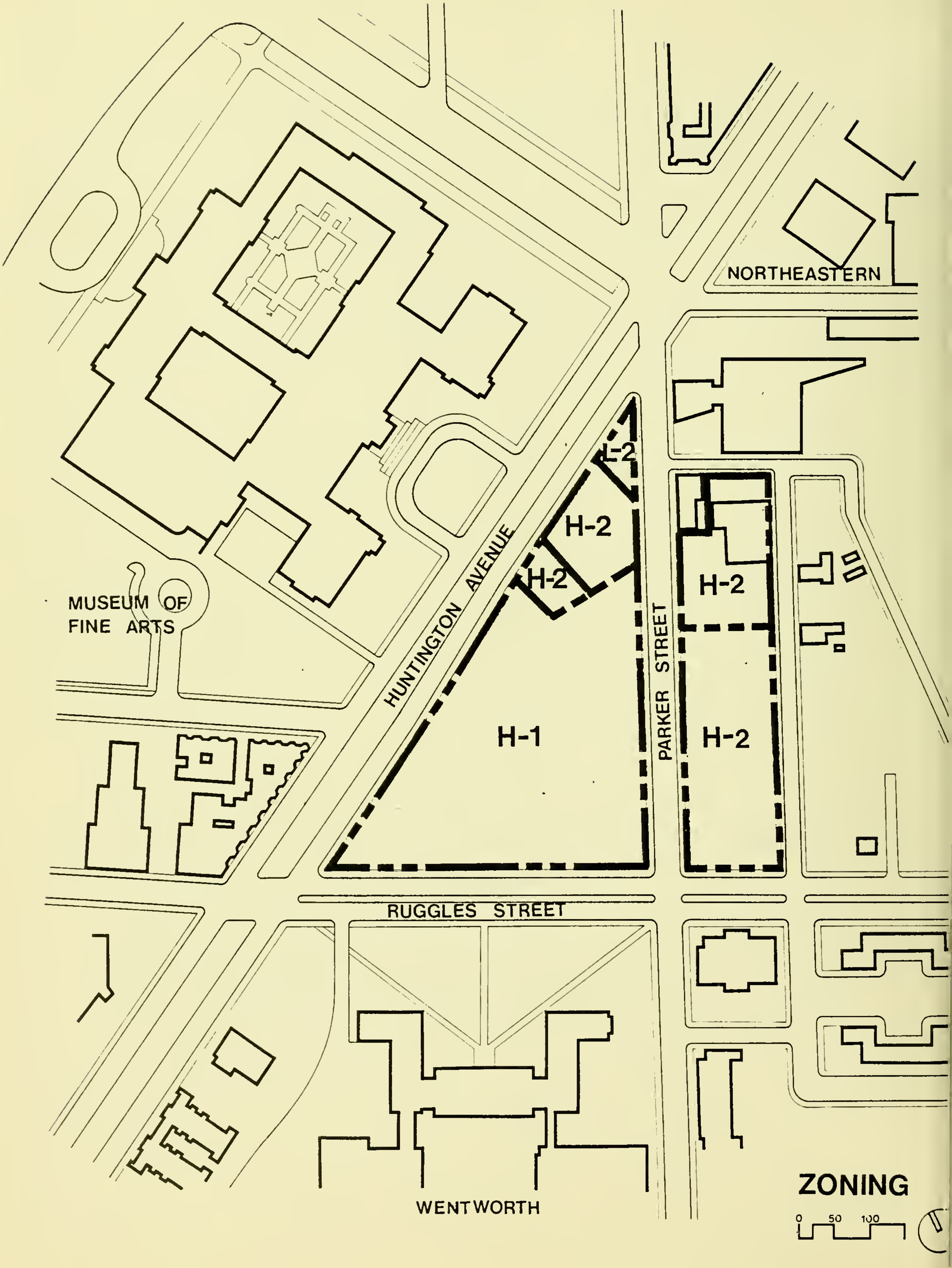
Parcel D: Privately owned "Punter's Pub."

Parcel E: Commonwealth owned land currently used by Northeastern for 110 parking spaces.

Parcel F: Northeastern owned parcel used for parking and includes 2 structures.

This reclaimed site is essentially flat with existing ground surface being about Elevation +17 (Boston City Base). Based on a preliminary review of available soil boring data in the general area, the following simplified subsurface profile is anticipated. The site is underlain by about 15 feet of miscellaneous granular fill which, in turn is underlain by approximately 15 feet of soft organic silt and/or peat. At a depth of 30 feet, a three-foot stratum of compact sand and gravel is anticipated.

Next in the sequence is an extremely thick deposit of Boston blue clay extending to a depth of almost 200 feet below ground surface. Typically, the top of the deposit consists of a stiff yellow clay which, with increasing depth, becomes softer and more compressible. It is anticipated that the stiff clay crust is relatively thin in comparison to most other areas in the Boston vicinity where the blue clay deposit is found. Below the clay is a very dense glacial till at least 70 feet in thickness which overlies bedrock consisting of a sedimentary shale-like material known as Cambridge argillite. Groundwater is anticipated at a depth of about 10 feet (i.e. Elevation +7).



ZONING

NORTHEASTERN
MUSEUM OF
FINE ARTS
HUNTINGTON AVENUE
PARKER STREET
RUGGLES STREET
WENTWORTH
L-2
H-2
H-2
H-2
H-2
H-1
0
50
100

ZONING

The site is currently zoned for Residential and Business usage with three separate zoning classifications. The present zoning will not permit either the usage proposed or the intensity of development proposed by the program and the Site Development Plan. The following summarizes the present zoning requirements:

1. Classification:

H-1	Residential	(FAR = 1)
H-2	Residential	(FAR = 2)
L-2	Local Business	(FAR = 2)

In addition, the project is located in two special districts:

a) Institutional Overlay District
b) Restricted Parking District

2. Permitted Usage:

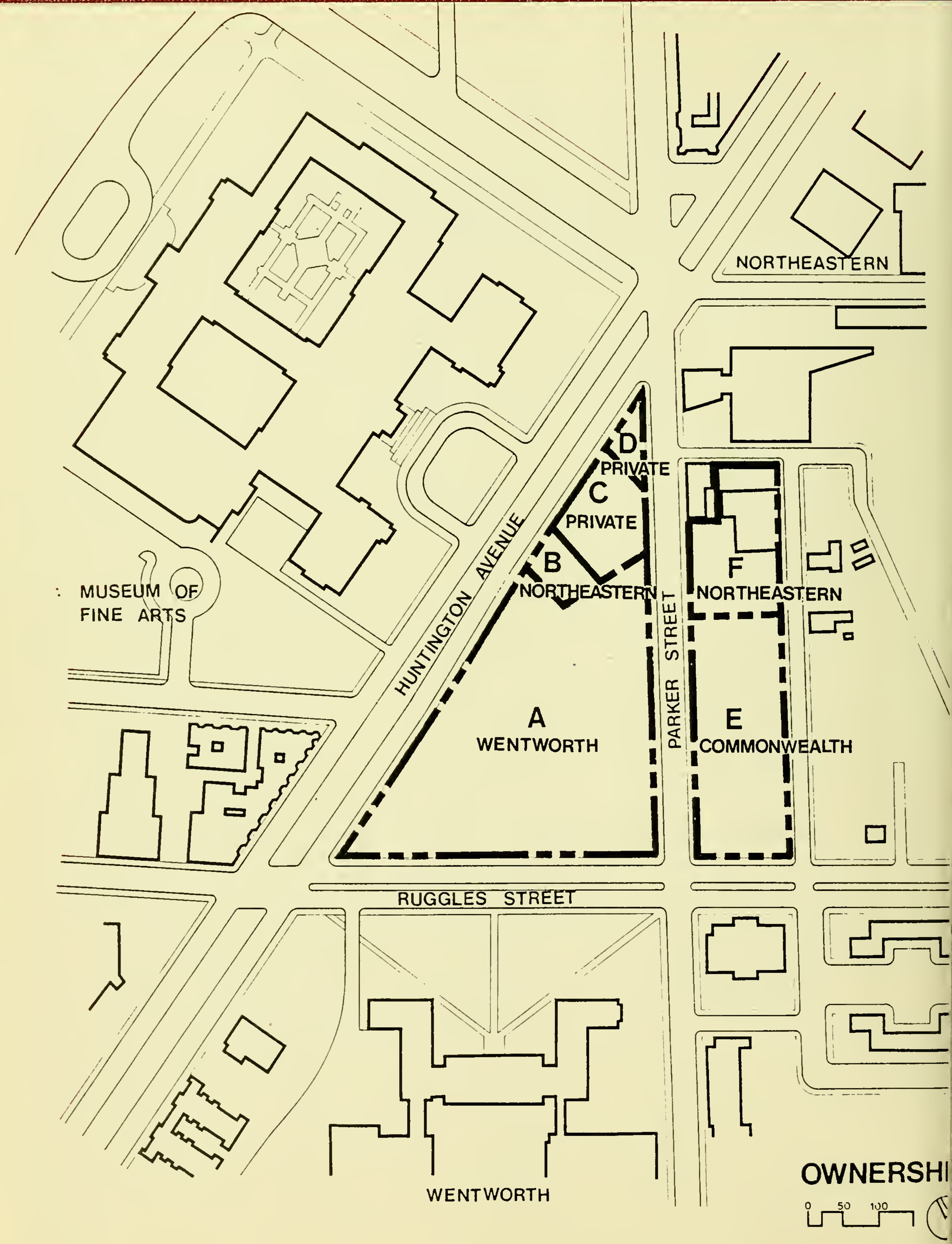
A = Allowed   C = Conditional   F = Forbidden

Use	H District	L District
Dormitories	C	C
Recreational	A	A
Stores(Local Business)	F	A
Restaurant	F	A
Laundry	F	A
*Parking Garage	C	C
Bank	F	A

*C in Restricted Parking Zones except for dormitory use.

3. Off Street Parking Requirements:

Use	FAR	Spaces Req'd
Residential	1.0	0.9/DU
Residential	2.0	0.7/DU
Retail	2.0	1.0/500 SF + 1 for each add'l 1000 SF


NORTHEASTERN
D
PRIVATE
C
PRIVATE
B
NORTHEASTERN
F
NORTHEASTERN
MUSEUM OF
FINE ARTS
HUNTINGTON AVENUE
PARKER STREET
A
WENTWORTH
E
COMMONWEALTH
RUGGLES STREET
WENTWORTH
0
50
100

OWNERSHI

4. Off Street Loading Requirements:

Group 2 15,000 - 50,000 SF = 1 Space

5. Special Purpose Overlay Districts:

The base district regulations apply as long as they do not conflict with special regulations of the overlay district.

6. Parking in Restricted Parking Districts:

The Zoning Board of Appeals will grant conditional use for off street parking facilities only if:

a) It serves a demand not adequately provided for by public transportation
b) It will replace existing off street parking spaces in one or more nearby parking facilities or, if it will replace legal on street parking spaces that have been eliminated.
c) It is ancillary to a use which does not contribute significantly to traffic flows during peak hours.

7. Dimensional Regulations:

Use	FAR	Max.Ht.	Front Yard	Parapet Setback
H-1	1.0	None	20'	(H+6)-6
H-2	2.0	None	20'	(H+6)-6
L-2	2.0	None	None	(H+6)-6

III. Alternative Plan Concepts

STUDENT HOUSING: COMPARATIVE ANALYSIS

The design of student housing has undergone great change during the past half century and there are numerous design concepts available for comparative purposes. However, the most recent pressure to provide more student living space for less money has led, in some instances, to long corridor floor plan configurations and a resulting institutional character not conducive to either study or sleeping functions.

In order to provide more options in terms of hierarchies of space and consequently, provide smaller and more identifiable groupings of students, the straight corridor concept has been supplemented by a "suite" type plan where several student rooms are clustered around a common suite living/study room and shared toilet facilities.

For the purposes of this study, the following student housing options have been evaluated regarding social grouping alternatives, square footage per student and consequently construction costs, lifestyle possibilities, and conversion potential or flexibility.

1. Traditional Corridor Plan 250-350 GSF/stud
   A complete floor or wing of a floor provides the basic social grouping with the ultimate size governed by the length of the corridor and the corresponding number of student rooms. Common toilet and lounge facilities are provided on this floor or partial floor basis.

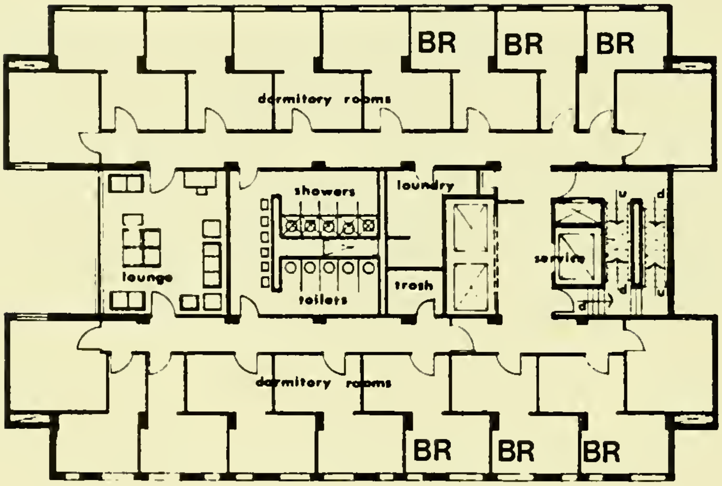
2. Entry or Suite System 275-300 GSF/stud
   The smaller social unit comprising from 4 to 18 student rooms are grouped either horizontally or vertically with common entries, lounges, and toilet facilities serving the entire suite.

3. Typical 2 Bedroom Apartment 303 GSF/stud
   Northeastern University now has plans underway to construct, under the Housing and Urban Development College Housing Program, typical 2 bedroom apartment units to serve 4 students. Two double rooms share a common living study area and bathroom facilities.

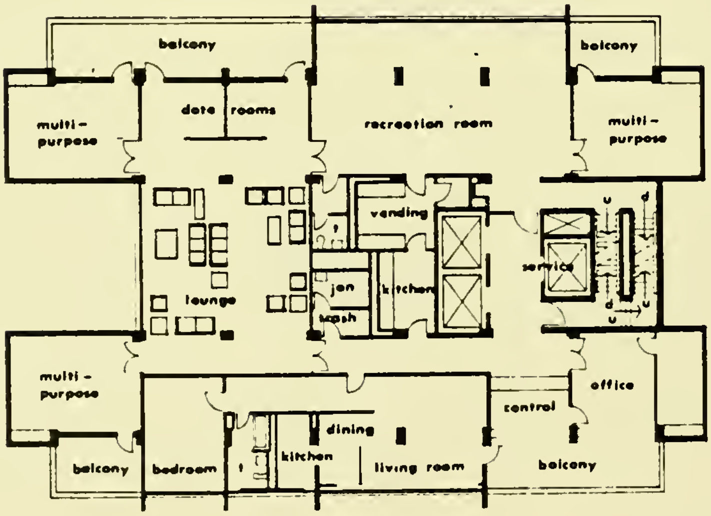
4. Four Student Suite 345-380 GSF/stud
   Four small, individual student sleeping and study rooms are clustered around a common living/dining room with small kitchenette and shared bathroom facilities.

Information regarding the HSA designed residential towers incorporating the Four Student Suite Plan at both Bowdoin College and the Massachusetts Institute of Technology indicates that this plan is extremely popular with students. The privacy afforded by the individual student rooms and the small social group of the 4 student suite has been articulated as basic reasons for the desirability of this residential unit. In addition, the ability to convert this basic 4 student suite plan into a 2 bedroom apartment for faculty usage leads us to recommend this concept for further development.

CORRIDOR PLAN

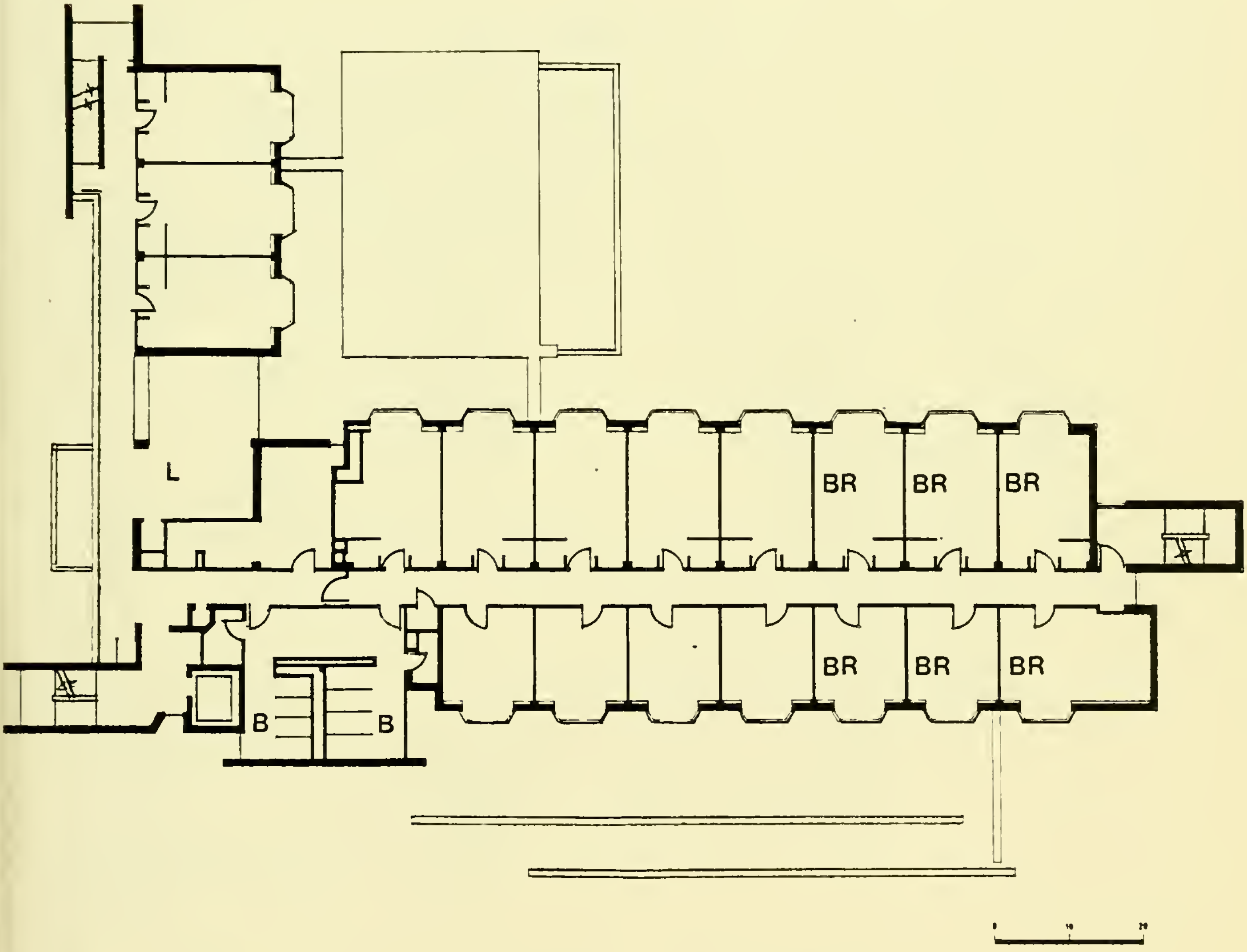


TYPICAL FLOOR

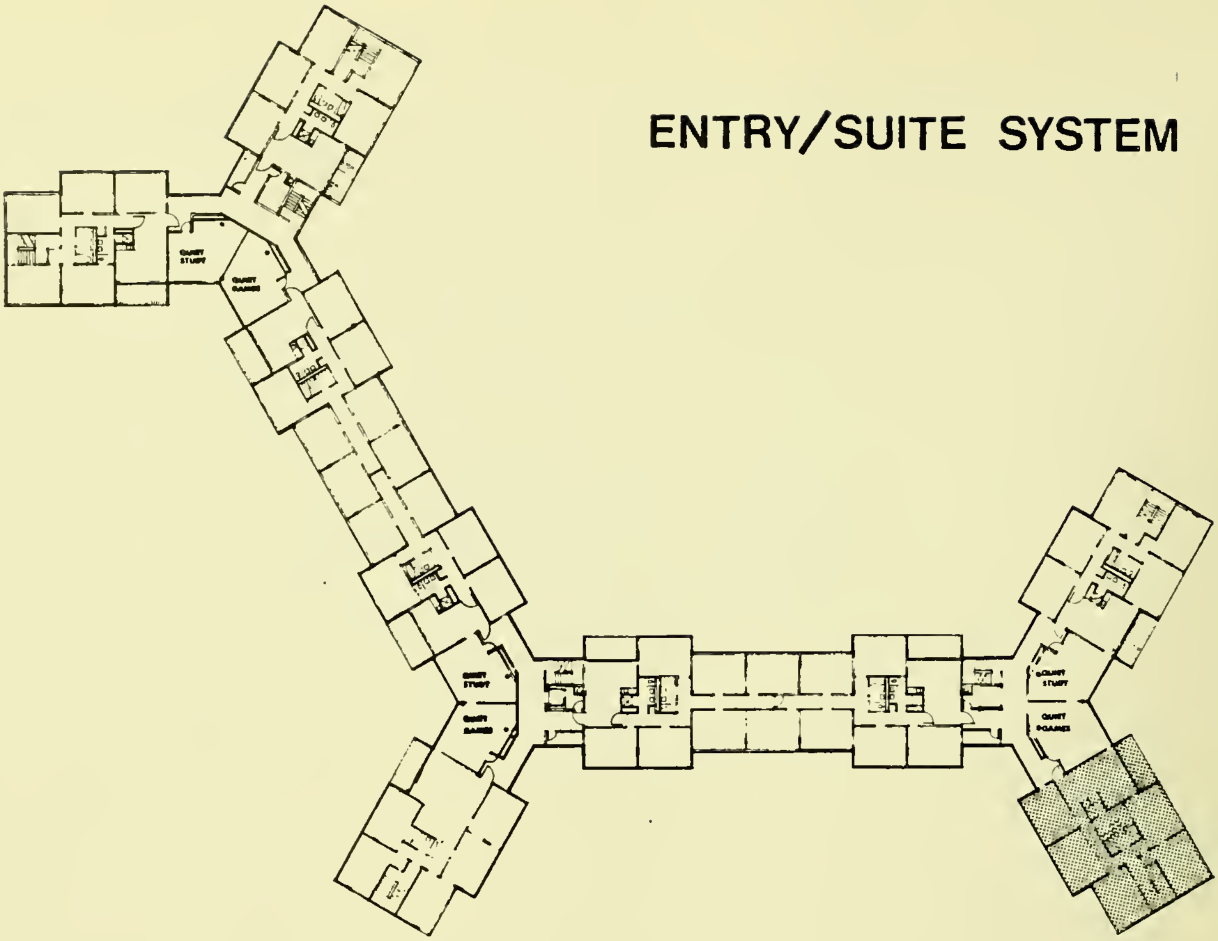


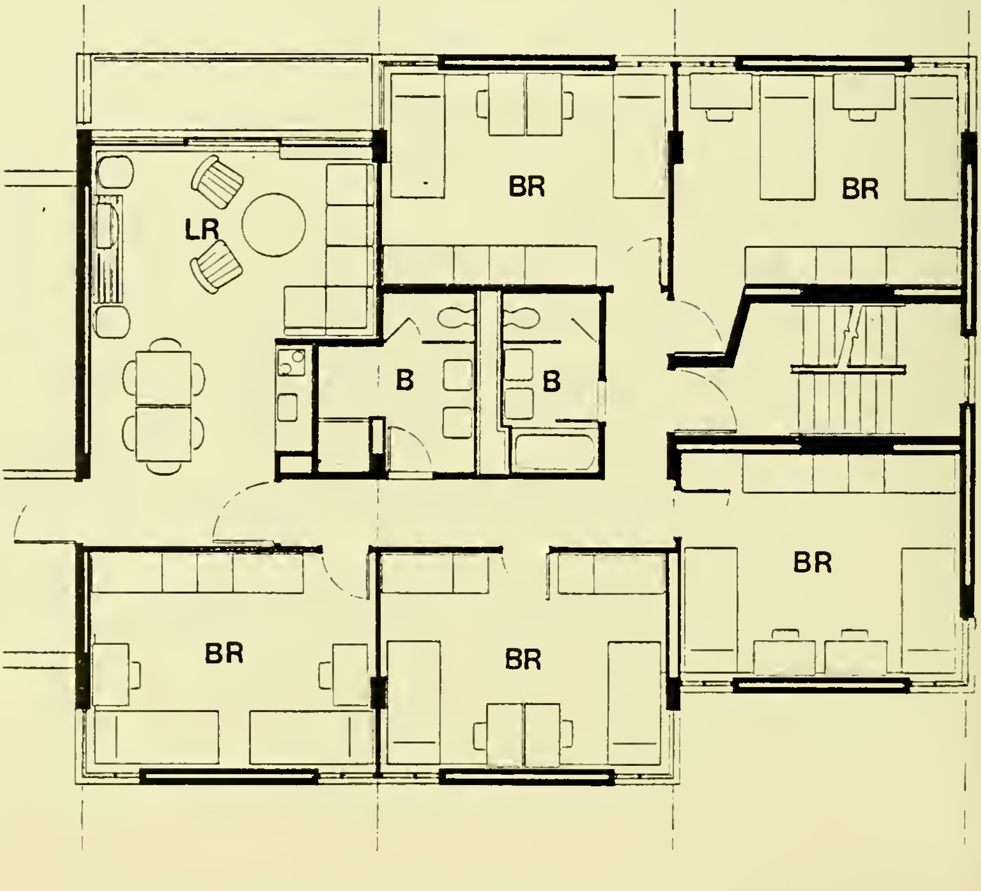
COMMON FLOOR

CORRIDOR PLAN



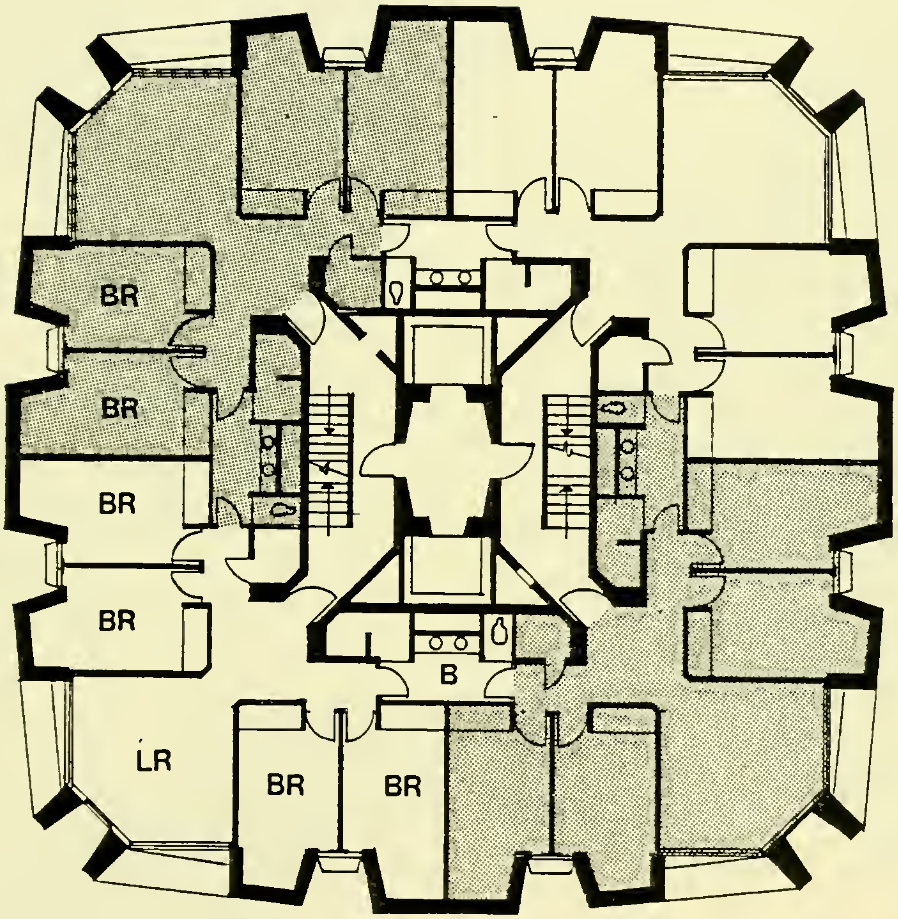
ENTRY/SUITE SYSTEM

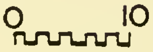




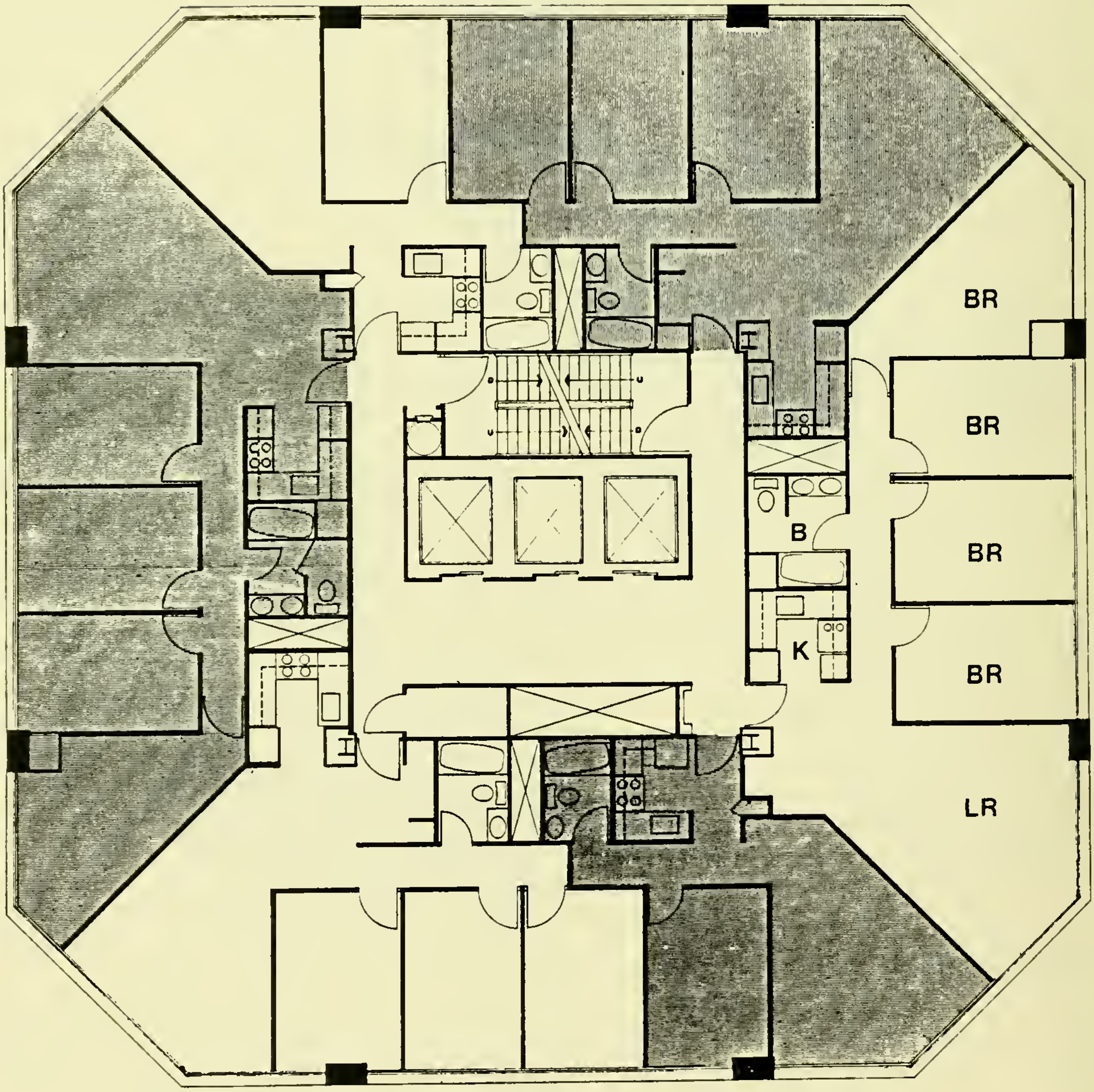
TYPICAL FLOOR PLAN of 10-STUDENT SUITE

4 STUDENT SUITE



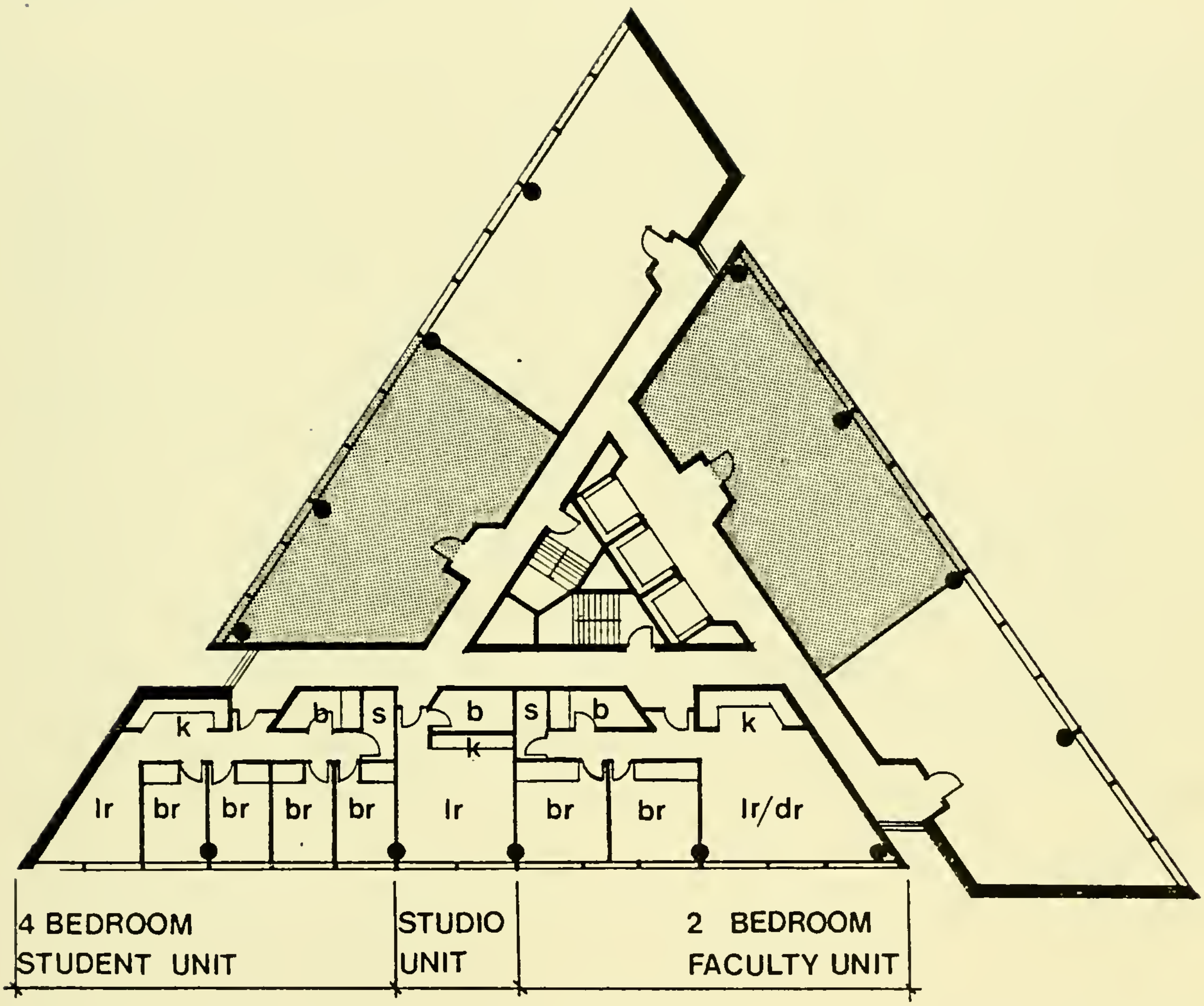


4 STUDENT SUITE



TYPICAL FLOOR PLAN

4 STUDENT SUITE



HUNTINGTON PLACE

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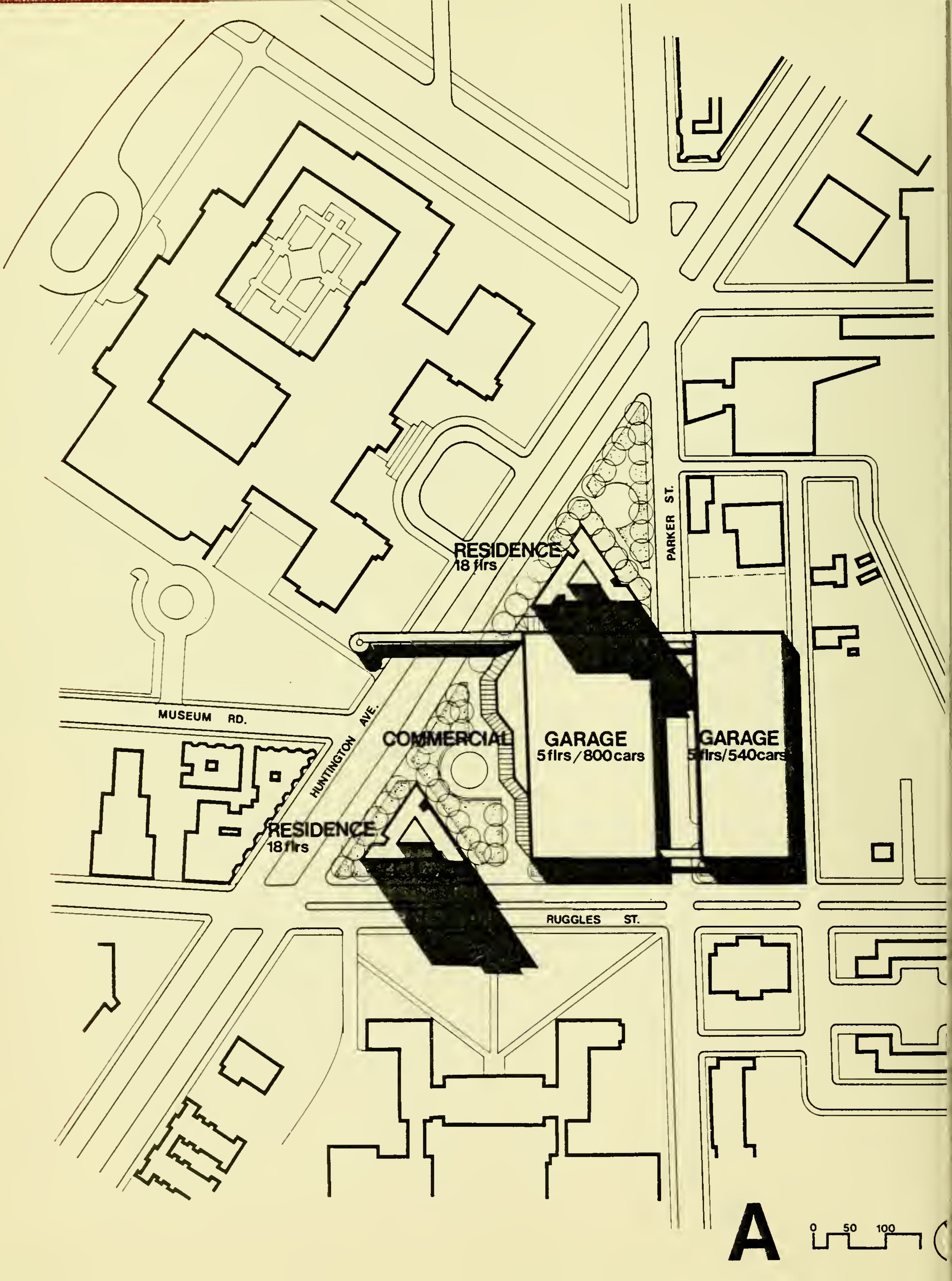
ALTERNATIVE SCHEMES

During the process of examining the site, analyzing the program, and generating the recommended Site Development Plan, five different site plan concepts were investigated. Each of these alternative schemes utilized the entire site area but provided different phasing options within the two or three phased development process. In addition, different massing, scale and spatial relationships were investigated as well as alternative vehicular and pedestrian circulation systems.

The five alternative schemes responded to the same general architectural program as follows:

1. Housing accomodations: 800 students;
2. Parking: 1,100 cars;
3. Commercial: 20,000 SF;
4. Roof top recreational area on the Phase 1 garage
5. Pedestrian overpass across Huntington Avenue.

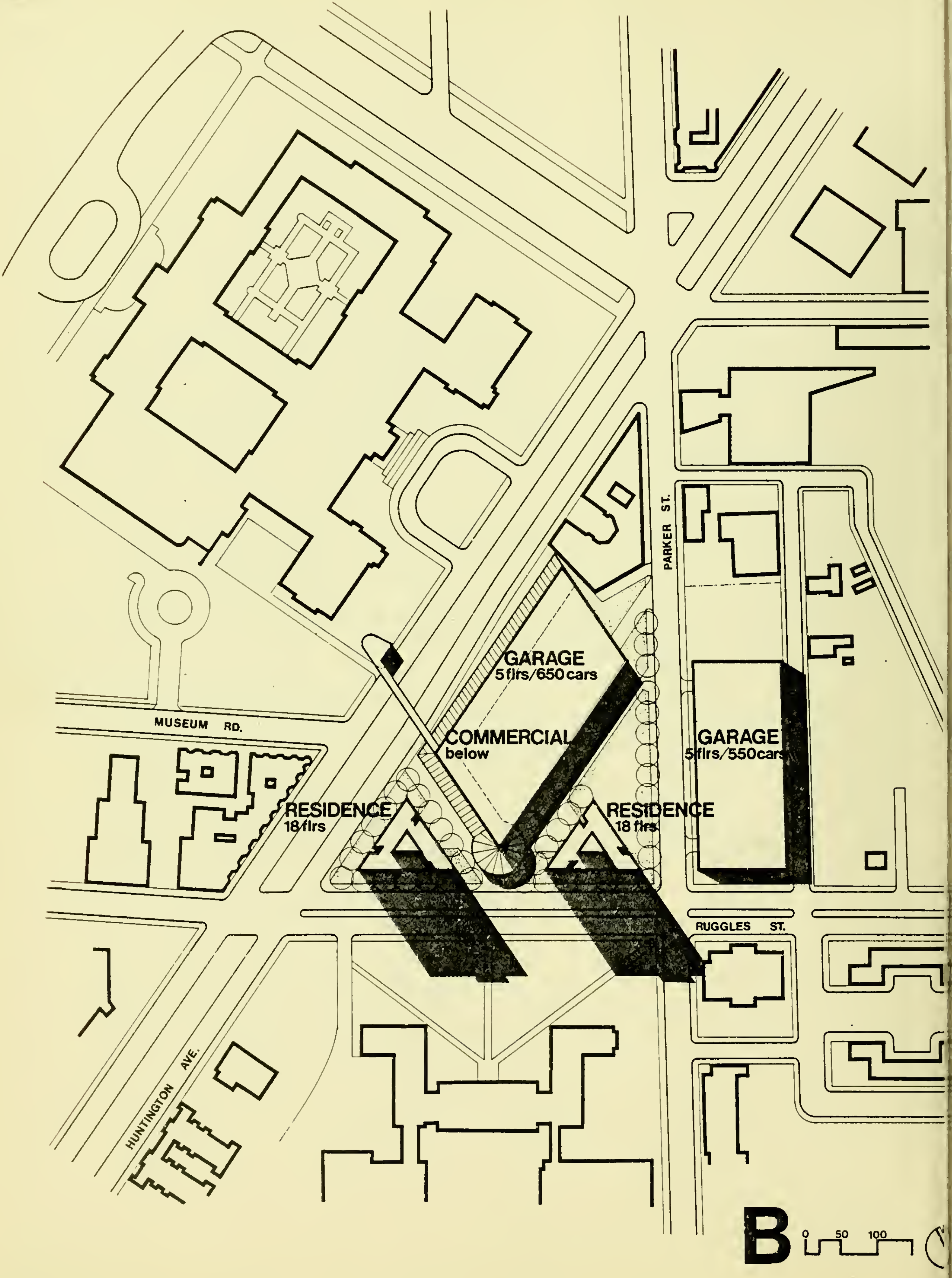

RESIDENCE
18 flrs
PARKER ST.
MUSEUM RD.
HUNTINGTON AVE.
COMMERCIAL
GARAGE
5 flrs / 800 cars
GARAGE
5 flrs / 540 cars
RESIDENCE
18 flrs
RUGGLES ST.
A
0
50
100

SCHEME A

Phase 1 of the Scheme A proposal includes a six story (5 above ground/1 below), 800 car parking garage on Parker Street, with 19,000 SF of ground level commercial space integrated into the parking structure and oriented to the primary through-site pedestrian circulation system and green space. In addition, a 400 student, 18 story residential tower is located on the corner of Huntington Avenue and Ruggles Street.

Phase 2 comprises a second 18 story residential tower on Huntington Avenue located on the axis of the Museum of Fine Art's classical entry arcade. Phase 3 anticipates the construction of another 6 story garage on the Commonwealth owned property on Parker Street accomodating an additional 540 cars. Access to both parking structures is provided from Parker Street.

Positive aspects of this scheme include the ability to build a major 800 car garage in Phase 1 along with the flexibility of financing and constructing only one of the residential towers. Negative factors include a major departure from the grain of Huntington Avenue and the resultant lack of reinforcement of the character of this corridor. In addition, further analysis has indicated that locating an 18 story tower directly on axis with the Museum entry results in difficult and inappropriate scale relationships and image response.

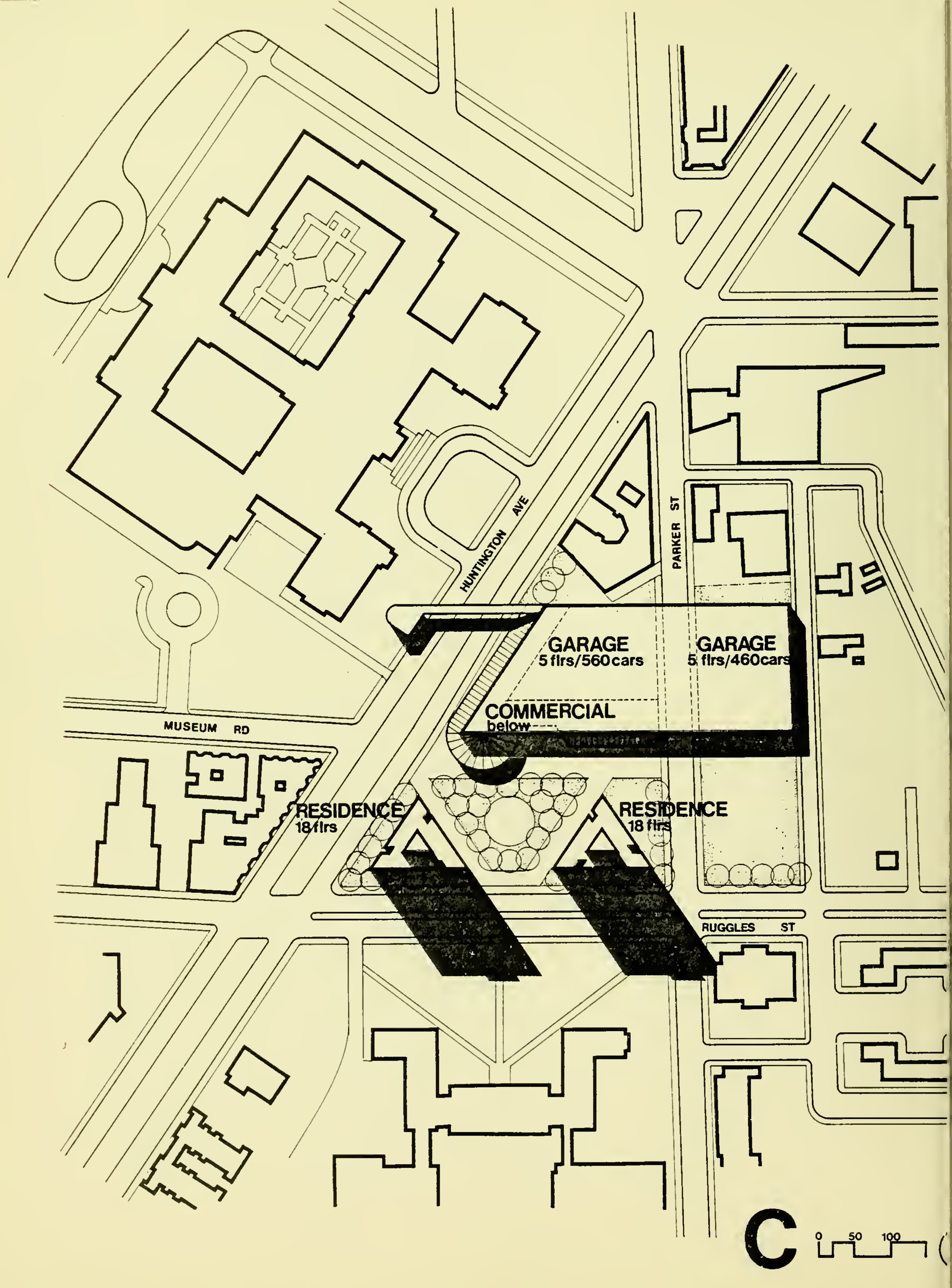

GARAGE
5 flrs/650 cars
COMMERCIAL
below
GARAGE
5 flrs/550 cars
RESIDENCE
18 flrs
RESIDENCE
18 flrs
MUSEUM RD.
PARKER ST.
RUGGLES ST.
HUNTINGTON AVE.
B
0
50
100

SCHEME B

Phase 1 includes the construction of both 18 story residential towers and a 650 car, 6 story parking structure. In addition, 20,000 SF of commercial space is located at grade along Huntington Avenue, moves diagonally through the development, and culminates in a circular restaurant form on Ruggles Street. This diagonal form reinforces pedestrian movement from Wentworth and Ruggles Street through the site and on to Huntington Avenue.

Phase 2 anticipates the construction of an additional 6 story, 550 car parking garage on the Commonwealth property. Scheme B does not require the acquisition of the privately owned parcels at the triangular intersection of Huntington Avenue and Parker Street. Although the project can be constructed without parcels C and D, we recommend that this property be acquired and developed into a small courtyard and park.

Although Scheme B provides a major new focus and image for Wentworth and significantly reinforces the Huntington Avenue corridor, this proposal eliminates the potential to develop a major open space within the project. In addition, the triangular park across from the Museum entry may not be used extensively and is difficult to justify spatially or aesthetically. As a result of this park, the Museum's formal entry space is not defined in either a positive or negative manner.


HUNTINGTON AVE
PARKER ST
MUSEUM RD
GARAGE
5 flrs/560cars
GARAGE
5 flrs/460cars
COMMERCIAL
below
RESIDENCE
18 flrs
RESIDENCE
18 flrs
RUGGLES ST
0 50 100

C

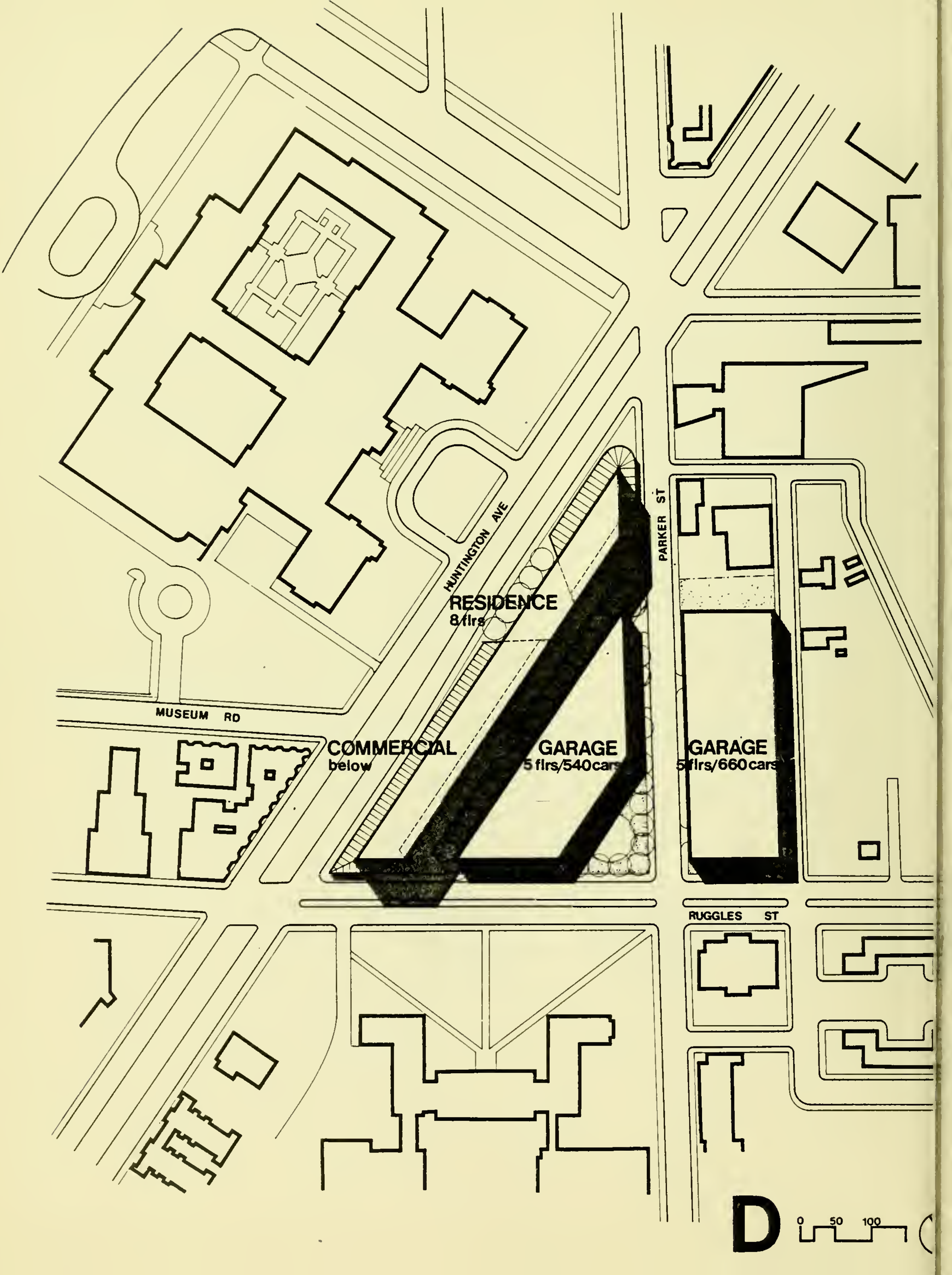
SCHEME C

Scheme C provides more options and open space potential than either Scheme A or B. Phase 1 includes both 18 story residential towers on Ruggles Street plus a 6 story, 560 car garage and 20,000 SF of commercial area. The open space, located between the towers, the commercial area and the garage will be developed into a courtyard-green space, and serve as a major focal point for both Wentworth and Northeastern.

Phase 2 proposes the continuation of the parking structure over Parker Street to provide 460 additional spaces.

Scheme C does not require the acquisition of parcels C and D, but acquiring these parcels and constructing a small triangular park is recommended.

The positive aspects of this scheme include the provision for a major new open courtyard that will be activated by residents of the towers, by the restaurant and bookstore which front on the open space, and by pedestrians walking through the site. Negative factors include the lack of any formal response to the Museum entry facade, and the requirement to construct long span structural bays in the Phase 2 garage to bridge Parker Street. In addition, the bulk of the completed garage is inappropriate and out of context with the existing and proposed urban fabric and grain.


HUNTINGTON AVE
PARKER ST
RESIDENCE
8 flrs
MUSEUM RD
COMMERCIAL
below
GARAGE
5 flrs/540 cars
GARAGE
5 flrs/660 cars
RUGGLES ST
D
0 50 100

SCHEME D

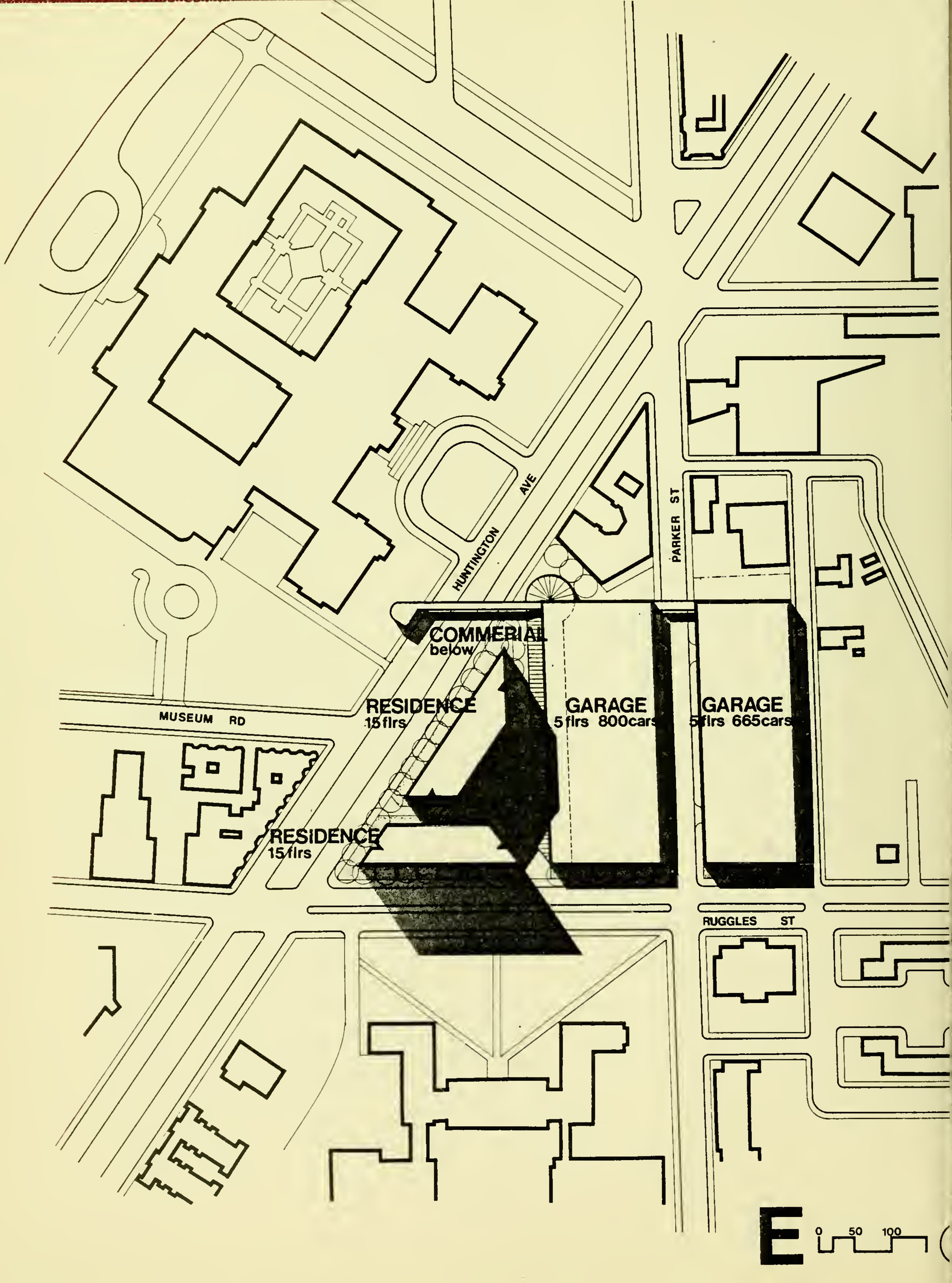
Phase 1 proposes a linear 8 story, low rise residential structure along Huntington Avenue to accomodate 620 students. The ground level of this structure will be devoted to 18,000 SF of commercial space. In addition, a 5 story parking structure for 540 cars is proposed.

Phase 2 extends the residential form to the corner of Huntington Avenue and Parker Street and provides for 180 additional students and 6,000 SF of commercial space.

Phase 3 anticipates the construction of a 6 story, 660 car parking garage on Parcel E.

Positive aspects of this scheme include the reinforcement of the Huntington Avenue corridor by the 700' long residential/commercial structure. In addition, this form provides a definite edge that confines the Museum entry space. The negative impacts of this scheme, however, are partially a result of this structure. At 8 stories and 700' in length, this form would be 3 stories and 100' shorter than the Church Park residential project located on Massachusetts Avenue across from the Christian Science Center. Although Church Park functions well spatially in relationship to the Christian Science Center, negative concerns have been expressed about the "walled monotony" of the project.

Another negative aspect of Scheme D is the resultant area left for the Phase 1 garage generates an inefficient form for the parking structure.


COMMERIAL
below
RESIDENCE
15flrs
GARAGE
5flrs 800cars
GARAGE
5flrs 665cars
RESIDENCE
15flrs
MUSEUM RD
HUNTINGTON AVE
PARKER ST
RUGGLES ST
0
50
100

E

SCHEME E

Phase 1 includes two 15 story, double loaded corridor plan residential towers, a 6 story, 800 car parking structure, and 20,000 SF of commercial space.

Phase 2 anticipates the construction of an additional 6 story, 665 car garage on the Commonwealth owned property.

The construction of residential facilities for all 800 students and, the design of an efficient, 800 car garage in Phase 1 are positive aspects of this scheme. Acquisition of the triangular parcels C and D is not required but is recommended. Direct pedestrian circulation through the site from Wentworth and Ruggles Street to Huntington Avenue is also possible.

Negative features include the intensity of land coverage and the resultant lack of open space, the walled mass of buidings on both Huntington Avenue and Ruggles Street, the lack of any positive form response and spatial relationship to the Museum, and the lack of reinforcement of the Huntington Avenue Corridor.

PROGRAM SUMMARY: ALTERNATIVE SCHEMES

		Phase 1	Phase 2	Total	
Scheme A:					
	Residential	400	400	800	Stud.
	Commercial	19,000	-	19,000	SF
	Parking	800	540	1,340	
Scheme B:					
	Residential	800	-	800	
	Commercial	20,000	-	20,000	
	Parking	650	550	1,200	
Scheme C:					
	Residential	800	-	800	
	Commercial	20,000	-	20,000	
	Parking	560	460	1,020	
Scheme D:					
	Residential	620	180	800	
	Commercial	18,000	6,000	24,000	
	Parking	540	660	1,200	
Scheme E:					
	Residential	800	-	800	
	Commercial	20,000	-	20,000	
	Parking	800	665	1,465	

EVALUATION

Schemes A through E were presented to the client/user group and discussed in terms of urban design parameters, construction efficiencies and economics, phasing options, spatial relationships, open space potential, access and circulation, and overall project impact, image, and sensitivity to the existing and proposed fabric and usage patterns of the area.

Schemes A and C were investigated in more detail, and Scheme C was eventually selected for continued development. Further modifications and refinement to the Scheme C concept has resulted in the following recommended Site Development Plan.

IV. Site Development Plan

PHASING

The recommended Site Development Plan includes two 18 story residential towers located on Ruggles Street, a 7 story (6 above grade/1 below) parking garage for 710 cars, and 19,080 SF of ground level commercial space oriented to Huntington Avenue and the open space courtyard. In addition, a pedestrian overpass is proposed to cross Huntington Avenue and provide access to the planned MBTA Greenline stop at Ruggles Street. A roof top recreational area located on the top level of the Phase 1 garage is also designed to accomodate 3 tennis courts and other outdoor recreation.

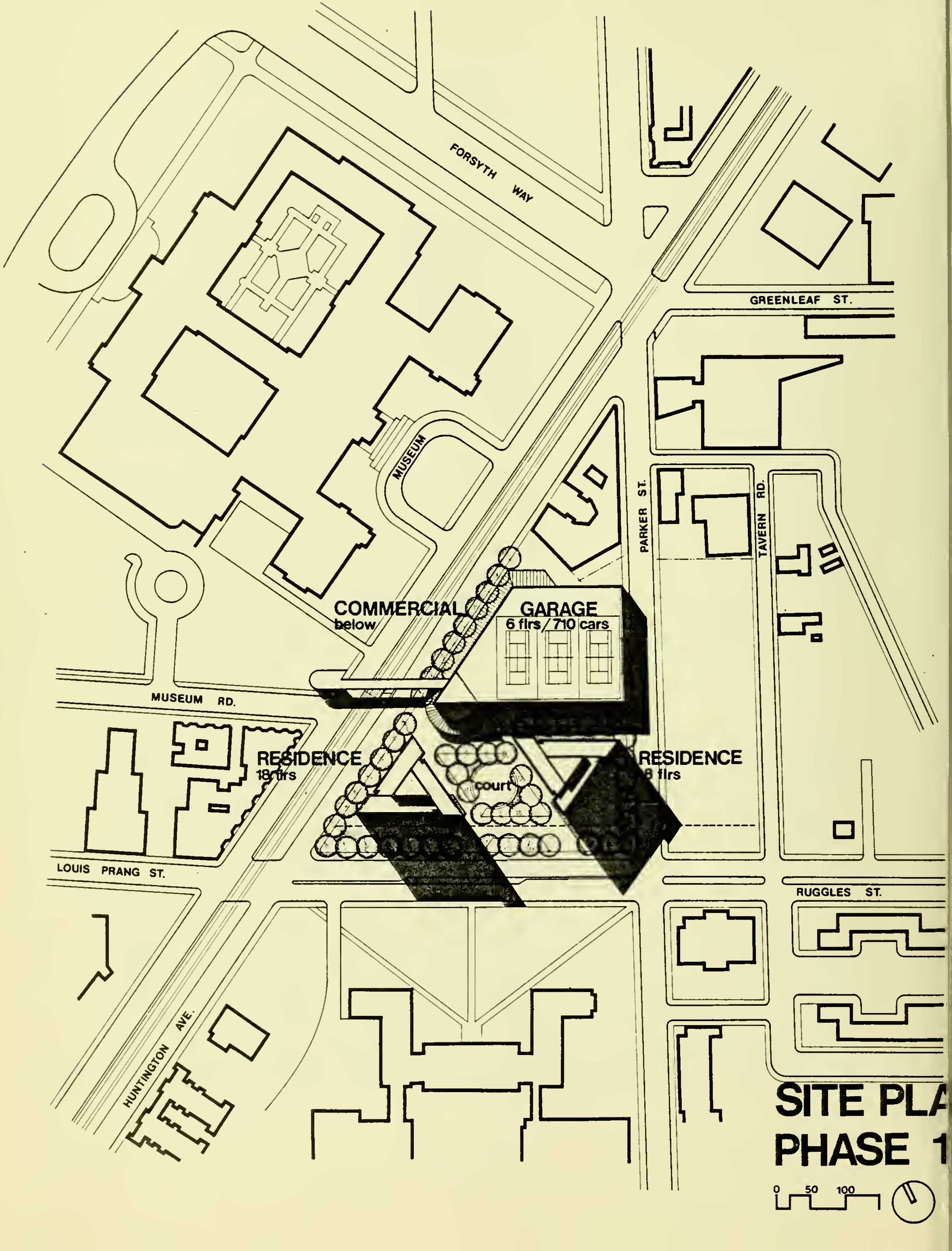
Phase 2 comprises an additional 5 story residential unit for 150 students located above 13,010 SF of ground floor commercial area.

Phase 3 anticipates the construction of a 6 story split level parking garage for 425 cars located on the Northeastern and Commonwealth owned property and accessible from Parker Street. A pedestrian bridge linking the two parking structures at the third floor level is also proposed.

DESIGN

The architectural form of the proposed Site Development Plan responds positively to reinforce the $4^1/_2$ to 6 story character of Huntington Avenue. The massing, height, and bulk relationships of the project are consistent with the surrounding urban area and, in addition, the 6 story low rise structure provides a finite edge that confines the articulated, classical facade and arrival courtyard space of the Museum of Fine Arts.

The scheme focuses on a major paved and planted exterior courtyard space formed by the twin residential towers and the garage/commercial area. This space is the primary organizational element of the project and will provide a sense of place and an identity for the development as well as a major pedestrian circulation and activity space. The courtyard will be animated by student and faculty residents of the towers and by the restaurant and bookstore functions located along the northern edge.



SITE PLA
PHASE 1

The triangular plan configuration of the towers is generated by both programmatic requirements and the geometry of the site. This plan is based on the 4 student suite concept discussed previously and includes provisions for one studio apartment per floor and also, provides flexibility to convert a typical 4 student suite into a 2 bedroom faculty apartment. The east tower is rotated to allow more direct through site pedestrian movement and, to reduce the visual impact and mass of the towers on Ruggles Street. In addition, the tops of both towers step down from 18 to 16 stories to provide useable rooftop terraces and to impart more visual interest to the tower forms. Orientation and views from these residential towers to all sections of Boston will be superb.

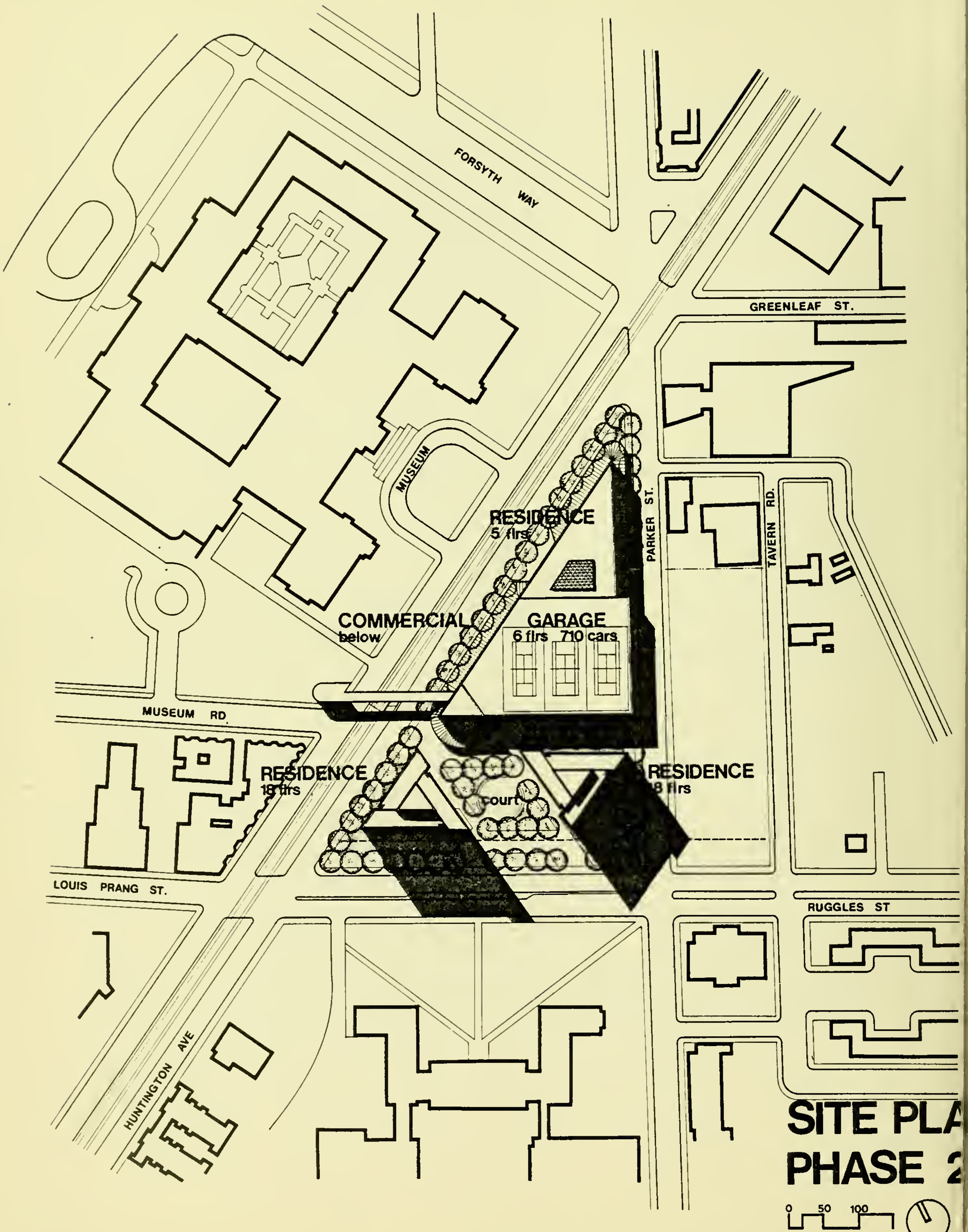
This scheme also provides program flexibility regarding the ultimate capacity of the parking structures. The Phase 3 garage can be extended both vertically and horizontally to accommodate more automobiles if necessary.

Exterior materials will include precast concrete spandrel panels on the garage structures, a panelized exterior wall system for the residential facilities, and bronze tinted heat absorbing glass in the towers, low rise residential structure, and in the glass front and sloping glass roofs of the commercial areas. Small scale unit pavers are proposed to provide an intimate scale for the courtyard and walkways and attractive lighting and signage systems will be developed.

STRUCTURAL SYSTEMS

Both the residential towers and the low rise housing will utilize a steel structural system. Steel columns and beams will be used in conjunction with a metal deck and lightweight concrete floor topping. Seismic and wind loading will be resolved by diagonal steel framing members located in the elevator cores.

The parking structures will utilize a cast in place concrete column and beam system. The Phase 1 garage has been analyzed to use either a long span precast concrete double tee floor framing system or, a post tensioned reinforced concrete slab system. The Phase 2 garage will utilize the double tee structural floor system.



SITE PLA
PHASE 2

FOUNDATION SYSTEM

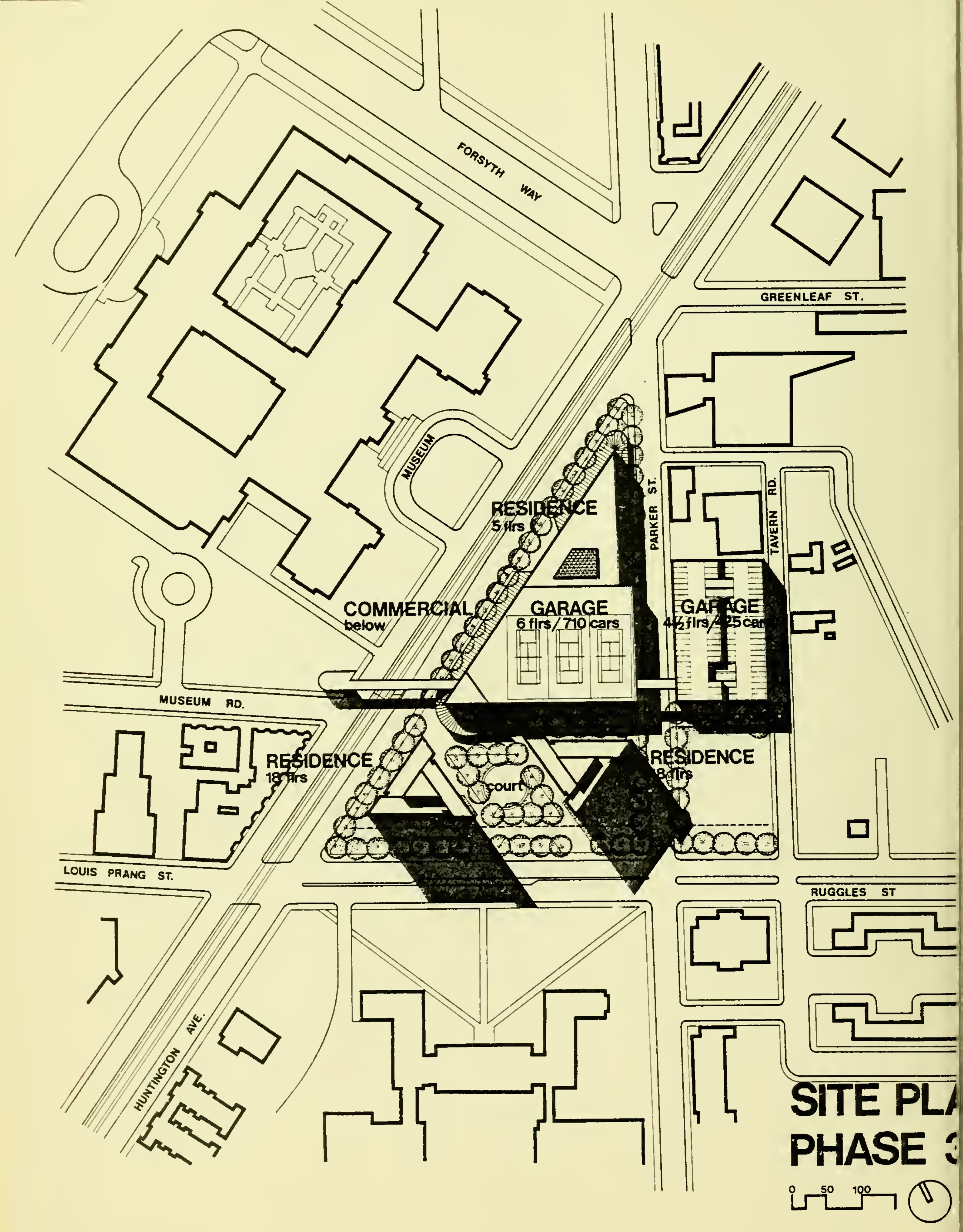
Due to the unsuitable bearing materials to a depth of 30 feet and in consideration of the underlying thick compressible clay deposit, the 18 story towers should be designed with a sub-basement slab about 27 to 30 feet below ground surface so that a mat foundation (designed for a uniform reaction) can bear directly on the compact sand and gravel stratum or on the top of the underlying clay deposit. The sub-basement should have interior structural walls to minimize the span of the structural mat.

The mat and exterior foundation walls should be waterproofed to Elevation +10. Metallic waterproofing on the interior surfaces is also recommended.

It is technically feasible to avoid the sub-basement (and the basement for that matter) by utilizing an extremely deep pile foundation. A 100 ton capacity, 14 inch square, precast prestressed concrete pile could be utilized assuming a spliced 200-foot length at a sub-contractor's cost of $20 per foot. Since the cost of this deep pile scheme is prohibitive, the mat foundation scheme is recommended.

The garage should be supported by belled caissons bearing on top of the thin sand and gravel stratum at a depth of 30 feet below ground surface. A bearing value of three tons per square foot should be utilized in the design and a maximum bell diameter of twelve feet with a two foot undercut should be assumed.

For this foundation scheme to be feasible, the garages must have one below-grade parking level, ideally at seven or eight feet below ground surface. This below-grade level should be bituminous concrete underlain by a two foot thickness of compacted gravel fill. A foundation underdrainage system is required.



SITE PLA
PHASE 3

MECHANICAL SYSTEMS

1. Heating, Ventilating, and Air Conditioning:

   Primary heating will be accomplished by means of low pressure steam supplied by oil fired boilers. The boiler room will be located in one of the residential tower buildings. If the garage/commercial building is built prior to the construction of one of the dormitory tower buildings, a small boiler will be installed for interim service to the commercial area.

   Cooling will be accomplished by means of chilled water supplied by central refrigeration chillers, with heat rejection to mechanical cooling towers. The chillers will be located in a mechanical room in one of the residential towers. If the garage/commercial building is built prior to the construction of one of the dormitory buildings, an air cooled packaged water chiller will be installed for interim service to the commercial area.

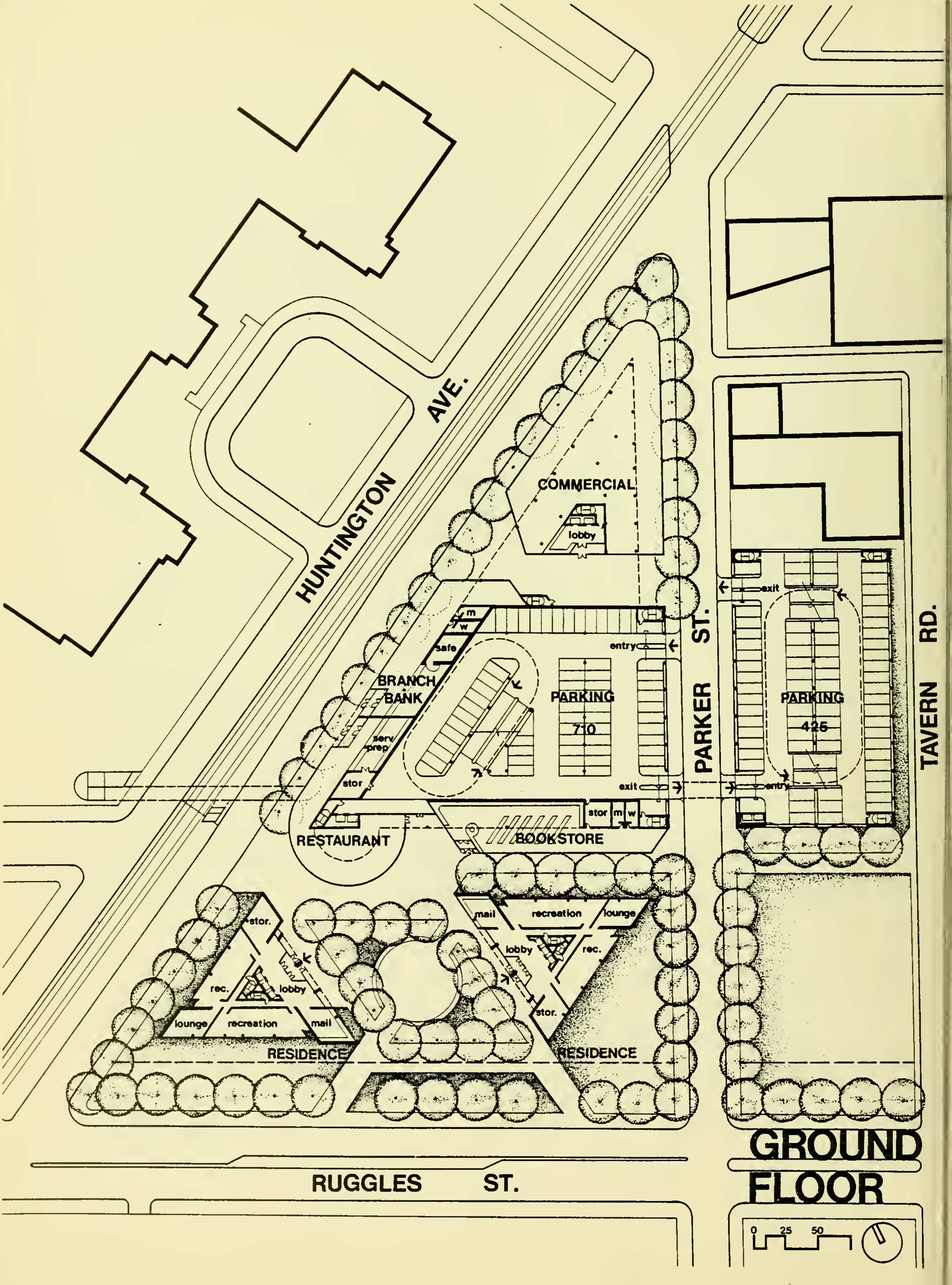
   The parking garages will not be heated. Above ground portions of the garages will be naturally ventilated through wall openings and the lower portions of the garages will be mechanically exhausted to prevent contamination of the air from engine fumes.

   Hot water for heating and chilled water for cooling will be provided to each commercial area. Heating and air conditioning equipment for these areas will be installed by the tenants to suit their various requirements.

   The residential facilities will be heated and air conditioned by means of vertical fan coil units. Hot water, chilled water and drain piping will be factory installed within the units to allow connection to units on the floors above and below with a minimum of external piping. The units will maintain desired room temperatures automatically.

2. Fire Protection:

   The garages will be equipped with a standpipe system in each stairwell with a fire hose cabinet and fire department valve at each level. All levels below ground and all levels above the sixth parking level will be equipped with a sprinkler system.


HUNTINGTON AVE.
COMMERCIAL
lobby
m
w
safe
BRANCH BANK
serv prep
stor
entry
exit
PARKING
710
PARKER ST.
PARKING
425
exit
entry
TAVERN RD.
stor
m
w
RESTAURANT
BOOKSTORE
mail
recreation
lounge
lobby
rec.
stor.
stor.
rec.
lobby
lounge
recreation
mail
RESIDENCE
RESIDENCE
RUGGLES ST.
GROUND FLOOR
0
25
50

The residential facilities will be equipped with a standpipe system in each stairwell with a fire hose cabinet and fire department valve at each level. Each dormitory will be equipped with a sprinkler system throughout.

Commercial spaces will be provided with capped connections for sprinklers which will be installed by the tenant of the space as it is completed.

All buildings and areas will be provided with a complete fire alarm system. The system will detect heat, smoke or the operation of the building sprinkler system and automatically transmit a signal to the Boston Fire Department, and all building signals.

3. Plumbing:

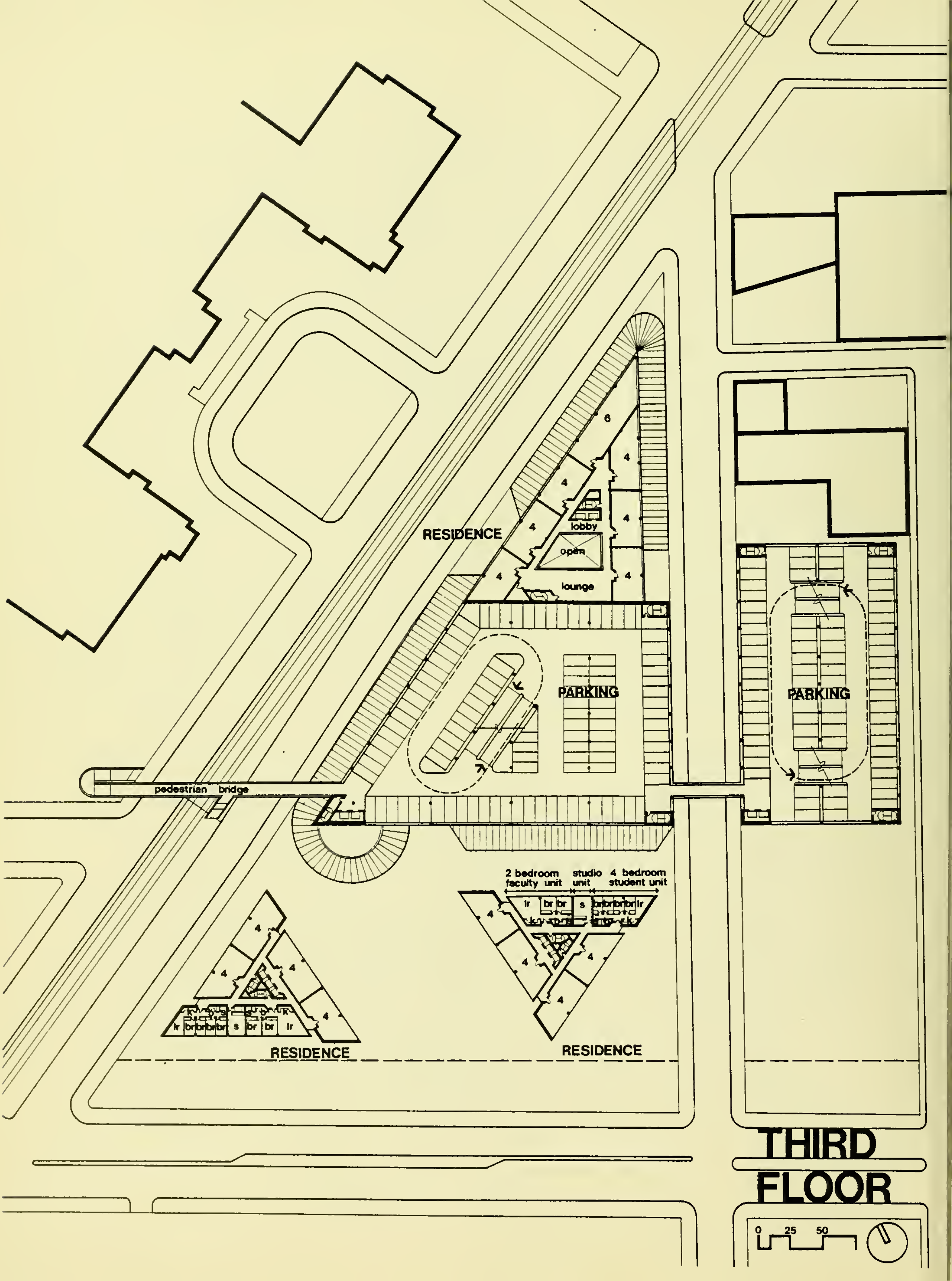
The garages will be equipped with drainage facilities, domestic cold water and domestic hot water. The drainage systems will separate storm and sanitary systems discharging to the street mains.

Each dormitory will be equipped with drainage facilities, domestic cold water and domestic hot water. The domestic cold water system will be distributed to all toilet rooms, kitchens and laundry facilities. The domestic hot water system will include two steam fired hot water heaters located in the basement.

4. Electrical:

The parking garages will be provided with high pressure sodium lighting in the parking areas and pole mounted high intensity discharge lighting for the roof tennis courts. The Phase 1 parking garage will contain the service entrance facilities for the entire complex. Also in the Phase 1 parking will be the emergency stand-by generator for the entire complex.

Each commercial space will be provided with a separate service, metering, panelboard, telephone service conduit, general fluorescent lighting, receptacles and emergency lighting battery units.


RESIDENCE
6
4
4
4
4
4
4
lobby
open
lounge
PARKING
PARKING
pedestrian bridge
2 bedroom faculty unit
studio unit
4 bedroom student unit
lr
br
br
s
br
br
br
br
lr
k
4
4
4
4
4
4
4
4
lr
br
br
br
br
s
br
br
lr
RESIDENCE
RESIDENCE
0
25
50

THIRD FLOOR

The residential facilities will be provided with ceiling and wall lighting receptacles, switching, power for kitchen equipment and living room telephone outlets. A master antenna television system with outlets located in each living room, lounge and recreation area will be provided to receive and distribute all commercial channels. Each residential unit will be provided with an apartment communication system to allow voice communication to the lobby master station and lobby door release. Emergency lighting will be provided in all corridors, stairs and lobbies.

An emergency stand-by system will be provided to all buildings from a single diesel driven generator set to be located in the Phase 1 parking garage. In addition to emergency lighting in all buildings and areas, except the commercial spaces, the emergency system will power a fire pump and one elevator in each building.

An underground telephone service will be provided to a telephone service equipment room in the Phase 1 parking garage with additional underground conduits to each building.

AREA TABULATION (GSF):

	Phase 1	Phase 2	Phase 3	Total
Housing	303,970	62,250	-	366,220
Parking*	257,026	-	142,876	399,902
Commercial	19,080	13,010	-	32,090
Recreation	37,496	-	-	37,496
Total	617,572	75,260	142,876	835,708

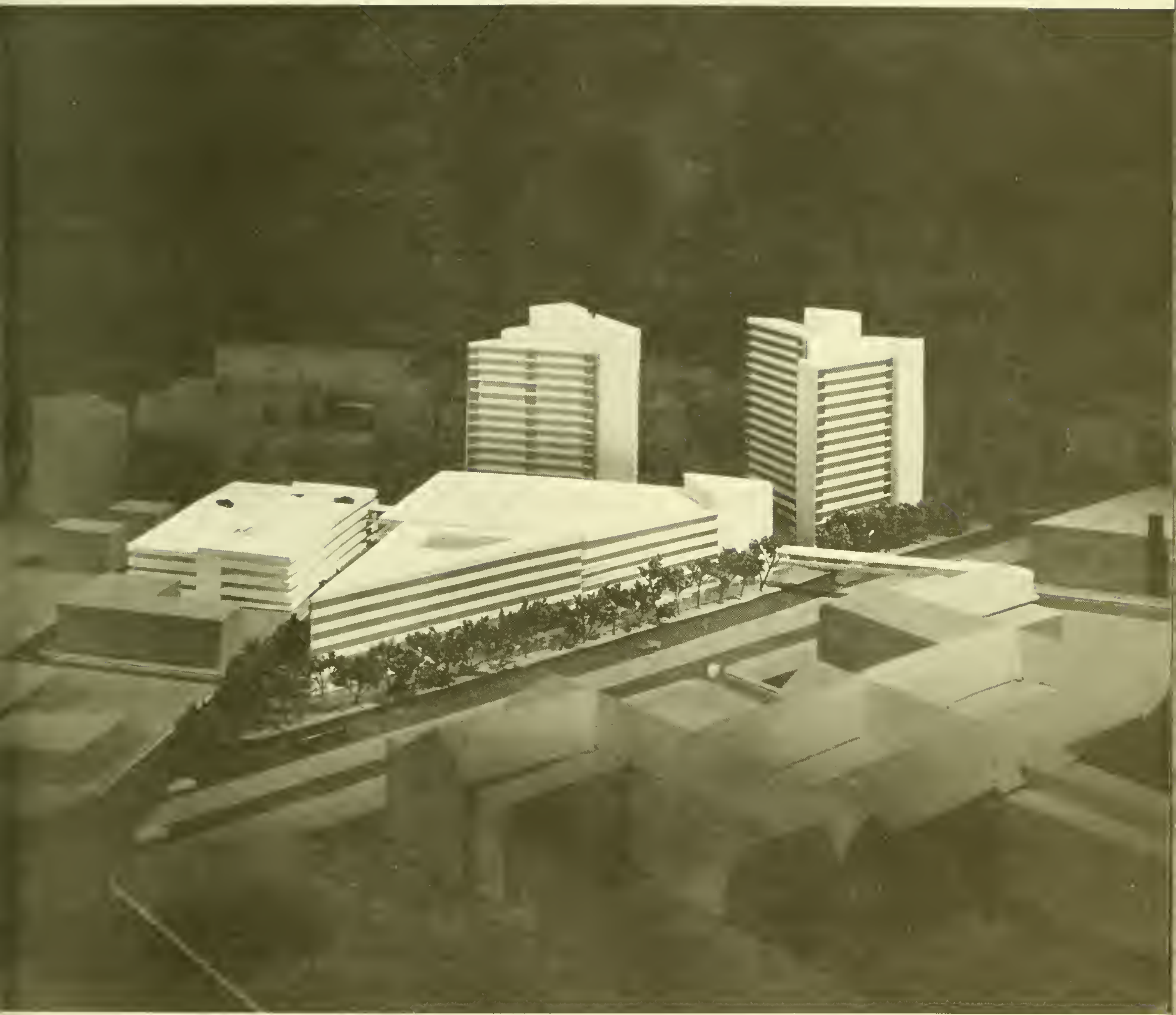
*Includes pedestrian bridges.

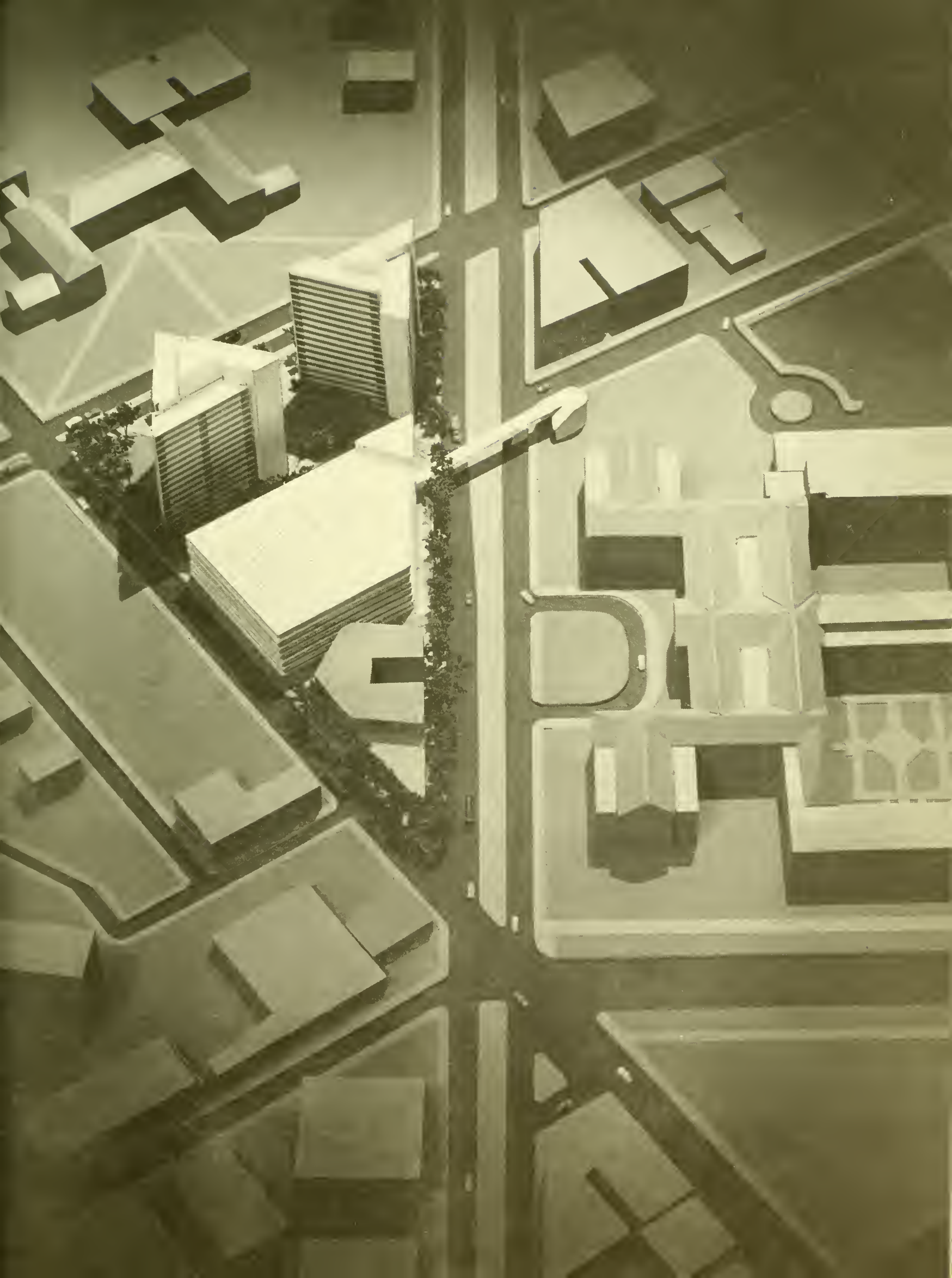
Zoning Calculation FAR Areas: (excludes mechanical space, shafts, storage, and basement parking. Includes ground floor parking)

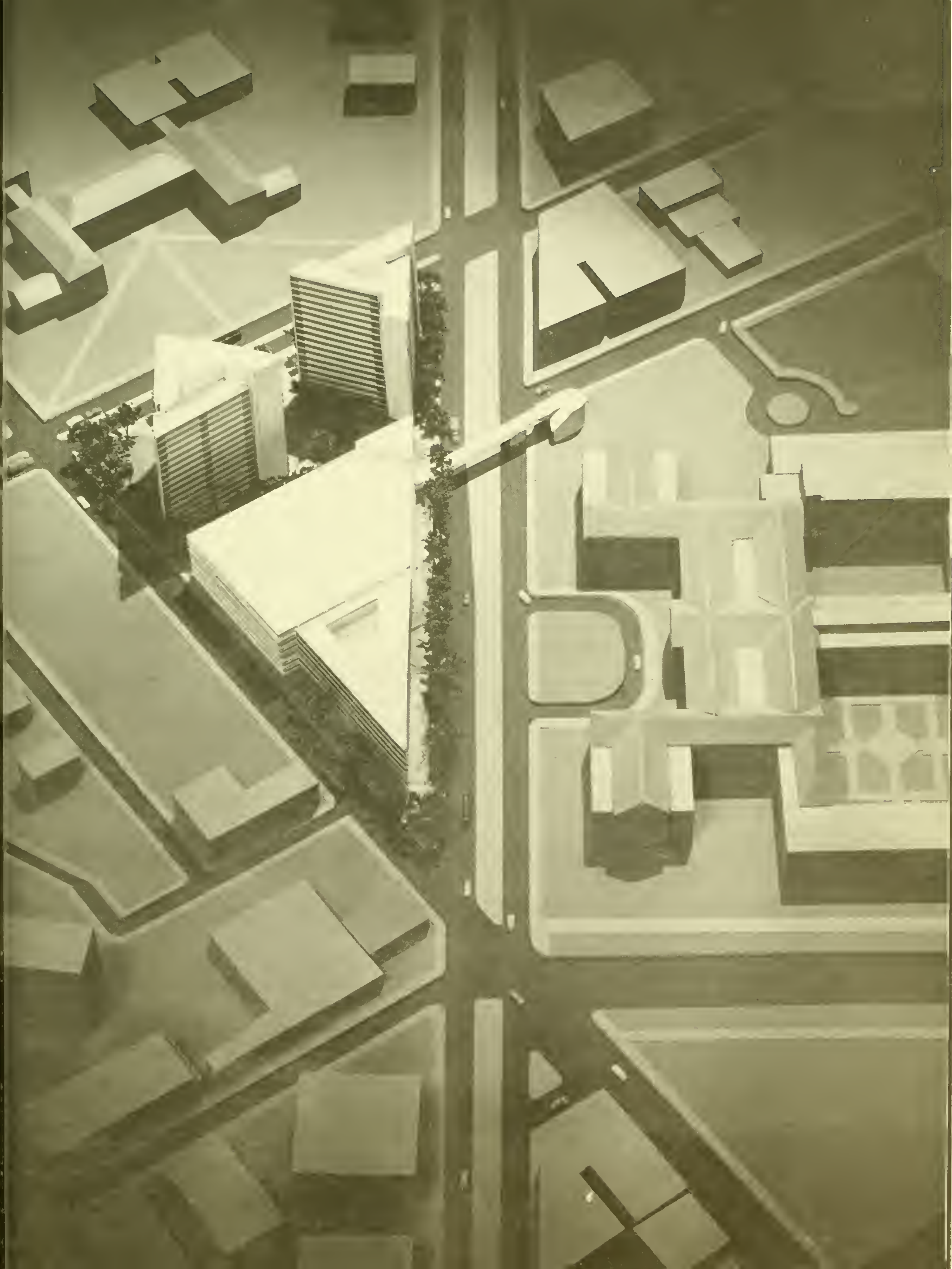
	Phase 1	Phase 2	Phase 3	Total
Housing	265,000	61,000	-	326,000
Parking	216,770	-	116,388	333,158
Commercial	18,000	12,000	-	30,000
Total	499,770	73,000	116,388	689,158

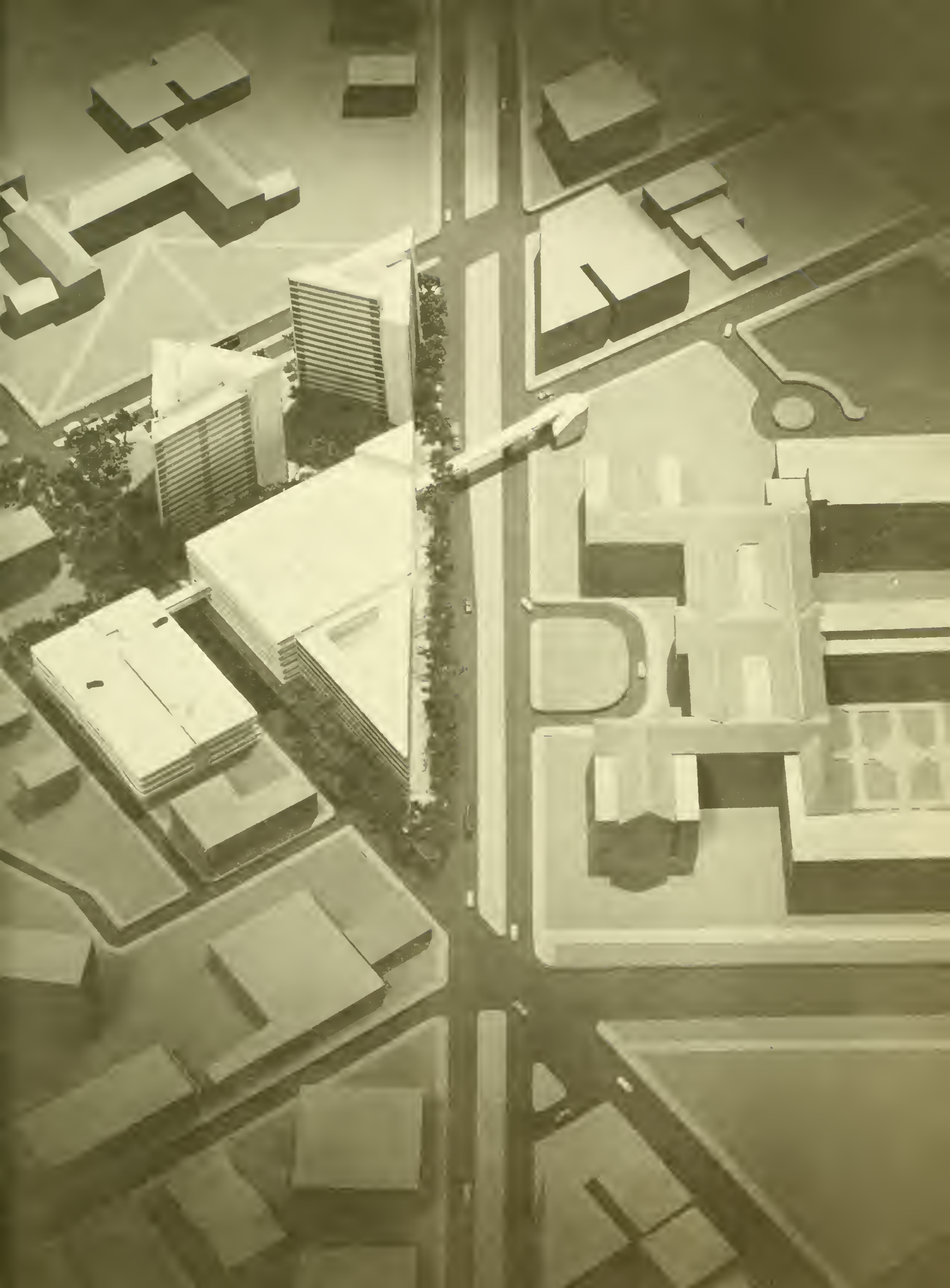
Site Area: 219,199 SF

Proposed FAR: $\frac{\text{689,158 SF}}{\text{219,199 SF}}$ $\frac{\text{Bldg. Area}}{\text{Site Area}}$ = 3.14

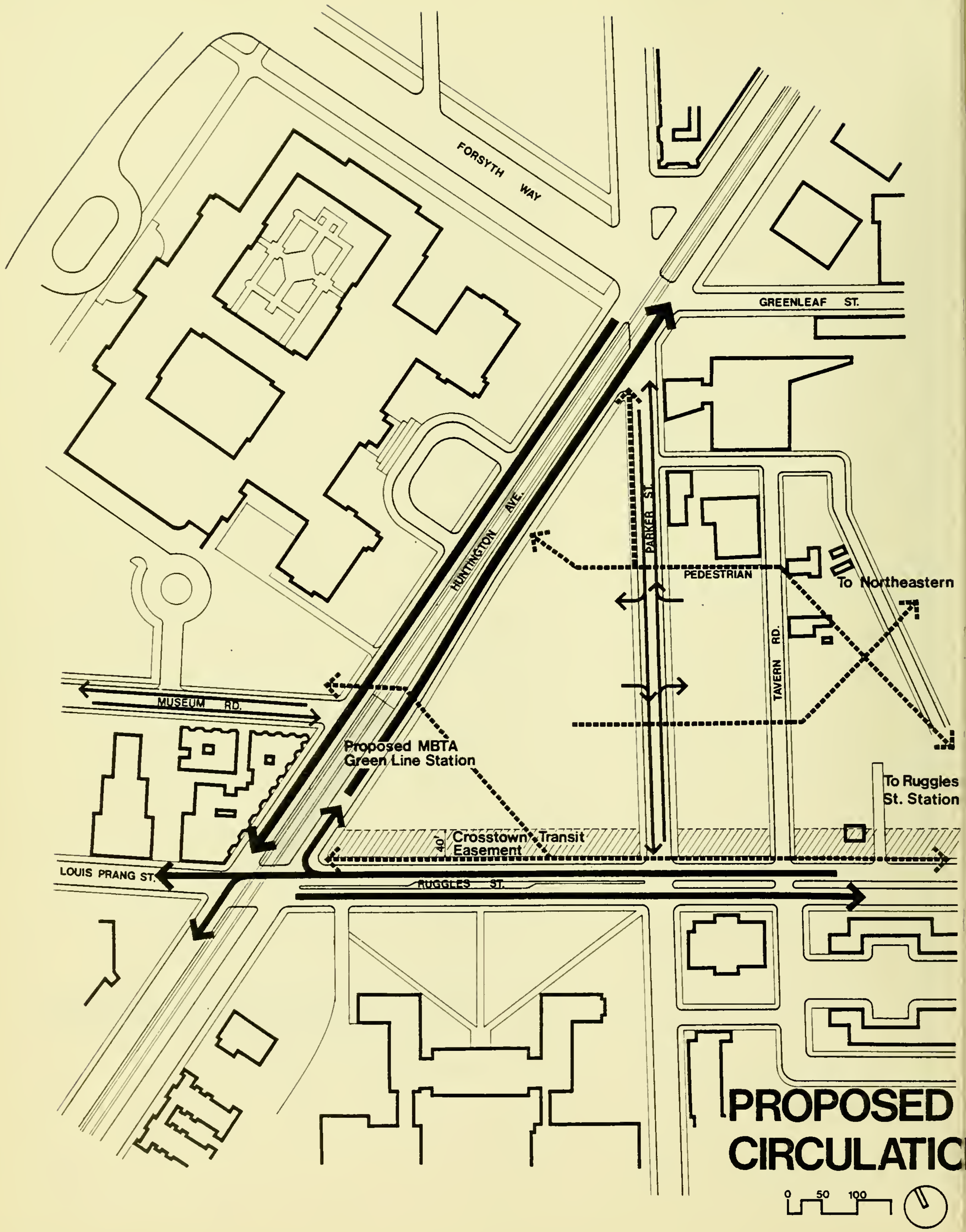








V. Transportation



PROPOSED CIRCULATIO

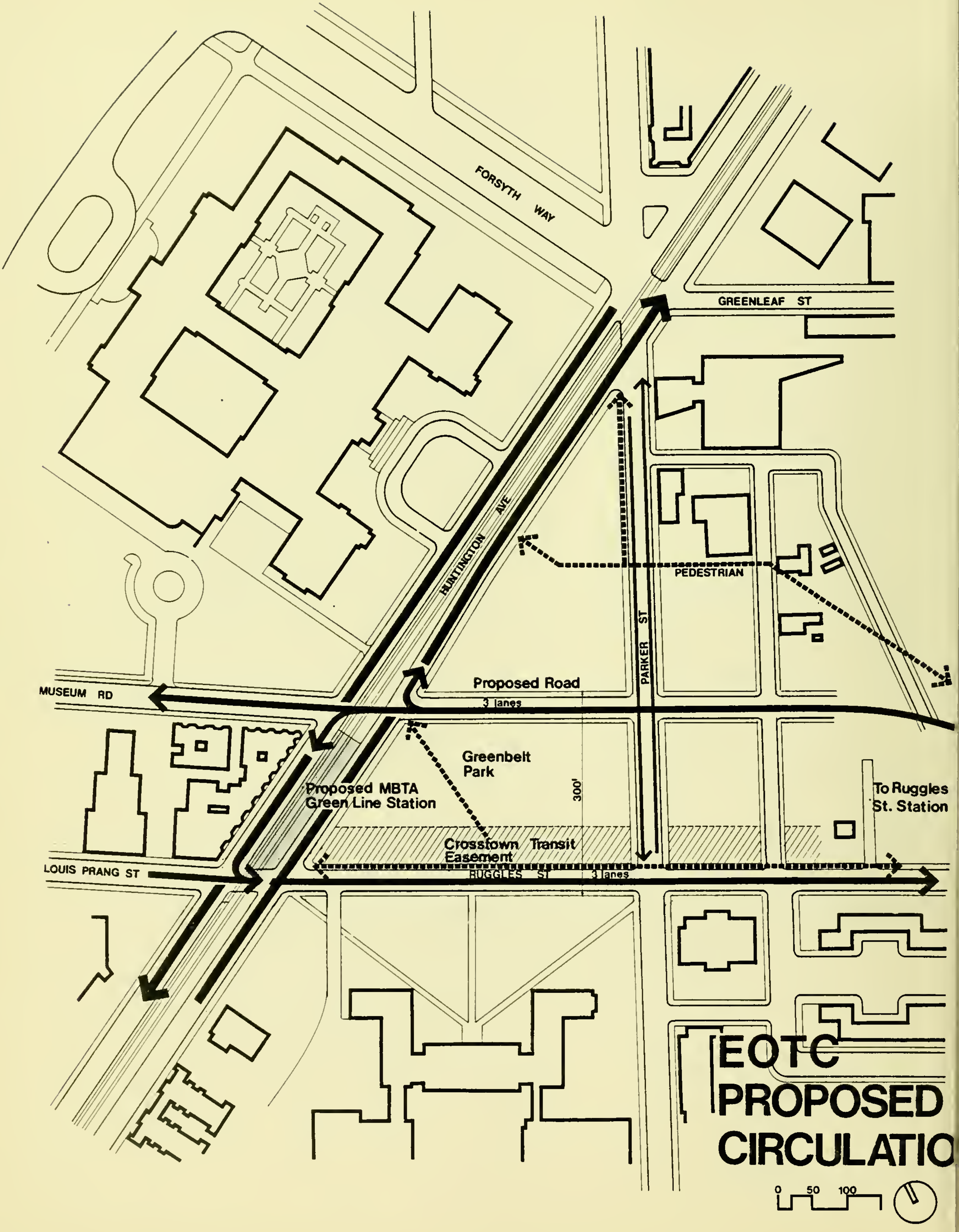
PROPOSED CIRCULATION

The Site Development Plan responds to the proposed widening of both Huntington Avenue and Ruggles Street. The schemes investigated and the accompanying data analysis, are consistent with the most recent plans developed for the TOPICS program on Huntington Avenue. In addition, the site area is reduced along the southern perimeter to accomodate an anticipated 80' right of way for Ruggles Street to provide two moving traffic lanes in each direction, a left turn/median strip lane, and sidewalks on both sides of the street. The Site Development Plan also responds to the 40' Cross Town Transit Easement requested by the Massachusetts Executive Office of Transportation and Construction. The feasibility of this rubber tire or rail cross town surface transit system is presently being investigated.

Mass transit service to the project area will be greatly improved in the future with the new Arborway Green Line MBTA stop at the corner of Huntington Avenue and Ruggles Street. In addition, the relocated Orange Line, commuter rail, and MBTA bus intermodel transit station on Ruggles Street will provide major access to the site and the three member institutions.

Major north-south vehicular circulation will continue on Huntington Avenue, with east-west traffic on Ruggles Street. Vehicular circulation on Parker Street is not expected to increase substantially unless major revisions are made to the surrounding street system in the area. Parker Street will provide more than adequate ingress and egress capacity for both parking structures.

Pedestrian circulation will increase substantially with the completion of the new Mass transit facilities. The Ruggles Street Station and the accompanying commercial development will direct pedestrians diagonally into the Northeastern Campus and also along Ruggles Street. Pedestrian routes along and through the site will result in three potential crossings on Huntington Avenue.


FORSYTH WAY
GREENLEAF ST
HUNTINGTON AVE
PEDESTRIAN
PARKER ST
Proposed Road
3 lanes
MUSEUM RD
Greenbelt Park
300'
Proposed MBTA Green Line Station
To Ruggles St. Station
Crosstown Transit Easement
LOUIS PRANG ST
RUGGLES ST
3 lanes
EOTC PROPOSED CIRCULATIO
0 50 100

EOTC PROPOSED CIRCULATION

To alleviate congestion caused by conflicting left turn movement patterns at the Huntington Avenue/Ruggles Street intersection, the Massachusetts Executive Office of Transportation and Construction has proposed a preliminary concept to revise Museum Road into a one way street for westerly moving traffic and to make Louis Prang Street and Ruggles Street one way to the east. This proposal separates the conflicting left turn movement from Ruggles Street onto Huntington Avenue and from Huntington onto Ruggles by some 200' horizontally.

However, to accomplish this proposed traffic pattern, a new 3 lane street would have to be constructed from the Ruggles Street Station, through Northeastern's property and westerly across the Huntington Place site to provide direct alignment with Museum Road.

The intersection congestion exists and a solution must be found to resolve this problem. However, the 300' swath this scheme proposes is not an appropriate solution. Not only would this one way street system require substantial land acquisition by the state from both Northeastern and Wentworth, but also, the city of Boston and FenPAC (Fenway Program Area Committee) have indicated they are not supportive of such a drastic solution that could increase traffic volume substantially in the Back Bay Fens. In addition, this solution will severely restrict expansion options for the Museum of Fine Arts and for the Museum School located between Louis Prang Street and Museum Road.

Huntington Avenue/Ruggles Street Alternatives

As an alternative solution to this proposed 300' right of way required by the EOTC proposal, the left turn conflicts could be resolved by improved signalization and by the inclusion of a left turn lane on Ruggles Street. This additional lane would provide a total of three lanes for traffic moving in the westerly direction at this intersection. The northern lane could proceed in a westerly direction onto Louis Prang or, make a right turn onto Huntington Avenue. The middle lane could continue to the west or, could also make a left turn onto Huntington Avenue. The southern lane would be reserved exclusively for left turns.

A similar 3 lane solution could be incorporated into the redesign of Huntington Avenue for traffic moving in a southerly direction at the Ruggles Street intersection.

VI. Costs

CONSTRUCTION COST ESTIMATE

The following construction cost estimate was prepared by the George B.H. Macomber Company of Boston, Massachusetts, based upon very preliminary drawings and outline specifications prepared by Hugh Stubbins and Associates. The original estimate has been revised slightly to reflect minor changes in dimension and subsequent areas. In addition, this estimate is based on a three phased construction sequence, and includes cost escalation factors presuming an April, 1979 construction start. Any phases which start construction after this date should be escalated by a factor of 8 to 10% per year.

Based on these assumptions and, on areas developed by Hugh Stubbins and Associates, the estimated construction cost is as follows:

Phase 1:	Area	Cost/SF	Cost
Parking Garage	254,266 SF	$21.50/SF	$ 5,466,719
Commercial	19,080 SF	$60.00/SF	1,144,800
Recreation Deck	37,496 SF	$21.50/SF	806,164
Pedestrian Bridge	2,760 SF	-	560,000
Residential Towers	303,970 SF	$45.00/SF	13,678,650
		Total:	$21,656,333
Phase 2:			
Residential	62,250 SF	$45.00/SF	$ 2,801,250
Commercial	13,010 SF	$79.75/SF	1,037,547
		Total:	$ 3,838,797
Phase 3:			
Parking Garage	142,252 SF	$20.50/SF	$ 2,916,166
Pedestrian Bridge	624	-	160,000
		Total:	$ 3,076,166
Total Construction Cost:			$28,571,296

GARAGE FEASIBILITY ANALYSIS

The financial feasibility of a garage is dependent upon three basic variables: the cost of the structure, the operating costs, and the income to be derived. Construction costs are the easiest to project, since the value is fixed initially by the bid price and other known variables such as financing rates.

Operating costs are subject to a greater range of estimates because they may vary based on several factors such as the method of operation, changes in utility rates, labor and insurance. For these figures, average values based on recent past experience have to be used.

Income projections are also dependent on decisions made about garage operation and the going rate for off-street parking. An added variable is the availability of competitive parking either in terms of location or price. One assumption in projecting income is that some spaces may be subsidized by the institutions. This can come in the form of charging lower parking rates for certain classes of users. However, it should be understood that any parker paying full market rate for a space is, in effect, receiving a subsidy. This is a common practice, especially when garages are operated by large employers who set aside a portion of the supply for employee parking.

The market rate for off-street parking in the area is about \$3.50 per day for all-day parkers and \$1.00 per hour for short term users. Assuming a short term space is occupied 60% of the day (9:00 am to 5:00 pm), these spaces should produce about \$5.00 per day. On the average, for preliminary feasibility analysis, each space should be worth about \$4.00 per day, whether or not the institutions charge that price. The following analysis is based on this estimate of income.

Construction Cost @ $6,500/space (1979 estimated construction cost)

1,100 spaces @ $6,500 @ 8% interest amortized over 20 years: Annual Cost: $720,000

Operating Costs, including Fixed and Variable: (not including taxes)

$225/space Annual Cost: $250,000

Total Annual Costs/Space:

$720,000 + $250,000 = $970,000 ÷ 1,100 = $ 880

Contingency Factor: 20% Use $ 1,050

Total Annual Income:

Assume 300 days @ $4/day/space x 1,100 spaces:

$1,320,000 $ 1,200/space

However, this analysis is based on the following assumptions:

1. There is no provision for taxes or payments in lieu of taxes.
2. Theoretical income from Northeastern and Wentworth parking devoted to dormitory and other users will probably have to be recouped from sources other than direct charges.
3. Museum of Fine Arts employees will probably be allowed to park at monthly rates that will be less than market price.

On the other hand, the turnover spaces used by Museum visitors will probably produce over the average $4 per day. In sum, the analysis appears feasible as long as it is recognized that a good part of the annual income will probably show up elsewhere and not from daily parking receipts.

The estimated cost per parking space for the Phase 1 and Phase 3 garages is as follows:

Phase 1: $5,466,719 ÷ 710 cars = $7,699/car

Phase 2: $2,916,166 ÷ 425 cars = $6,861/car

These costs recognize the following:

1. Approximately 10% escalation of construction costs to April, 1979;
2. Approximately $600 per car premium for subsurface conditions and resulting foundation systems;
3. Excavation for below grade parking levels;
4. Mechanical exhaust system for the below grade parking levels;
5. Sprinkler system for below grade parking levels and for the upper parking level of the Phase 1 garage (required by code);
6. Structural design for seismic conditions (required by code);
7. Some inefficiency in the design of the Phase 1 garage as a result of the site geometry, plan configuration, and ramping system;
8. Additional structural costs to support the Phase 1 recreation deck.

In addition, these figures represent an upper limit on a cost per car basis. Further analysis of the plan configuration and an investigation of complete precast concrete structural system should be examined. The construction cost escalation factor may also be reduced significantly from the 8 to 10% projected. The combination of all of these factors may reduce the cost per parking space substantially.

VII. Implementation

TRANSPORTATION

One of the initial tasks after completion of this report will be to work closely with the Boston Redevelopment Authority, the Executive Office of Transportation and Construction, and the Massachusetts Bay Transportation Authority to resolve transportation conflicts in the area and, more specifically, to come to an understanding and agreement concerning the resolution of the Huntington Avenue/Ruggles Street intersection problem. In addition, a formal agreement will have to be developed regarding the Cross Town Transit Easement and the green belt pedestrian space planned to link the new parkland of the Southwest Corridor Development Project with the Back Bay Fens. Resolution of these issues is necessary in order to proceed with the project.

ZONING

Rather than apply for individual zoning variances for use, floor area ratio, site coverage, open space requirements and setbacks, the Boston Zoning Code allows any project on a site greater that one acre to apply for a special Planned Development Area Status. The general requirements and procedures of this process are as follows:

1. The site area must be greater than one acre;
2. The plan must conform to the general plan for the city;
3. Nothing in the proposed plan can be considered injurious to the neighborhood;
4. The BRA must approve the plan and pass this recommendation on to the Zoning Commission;
5. The Development Plan must be submitted and include:

    a) Appearance of structures
    b) Open space and landscaping
    c) Proposed uses
    d) Densities
    e) Proposed traffic circulation
    f) Parking and loading provision
    g) Access and public transportation
    h) Dimensions of structures
    i) Possibly elevations, schematic drawings, and exterior materials (required at the discretion of the BRA)

6. In addition, future construction in the Planned Development Area must also be reviewed by the BRA and approved prior to granting a building permit.

ENVIRONMENTAL IMPACT STATEMENT

Due to the programmed number of parking spaces in the Site Development Plan and because the project is located within a Restricted Parking Zone, an Environmental Impact Statement may be required to address specific issues related to transportation within the project area and to air quality standards. However, since approximately 800 parking spaces are replacement spaces, the remainder of 335 spaces may not be of sufficient impact to require a full Environmental Impact Statement. The Massachusetts Executive Office of Environmental Affairs may however, require a less rigorous Environmental Impact Review of the project.

In addition, if state or federal funds are used to construct the project, an Environmental Impact Analysis may be required.

FINANCING

Preliminary discussions regarding the nature of the project defined the following potential financing sources:

1. Massachusetts Housing and Finance Agency (MHFA).
2. U.S. Department of Housing and Urban Development: Public Housing Subsidiary Programs.
3. U.S. Department of Housing and Urban Development: College Housing Program (HUD/CHP).
4. Massachusetts Health and Educational Facilities Authority (MHEFA).

Since the program for the housing component has developed to provide only student housing, the MHFA and HUD Subsidiary programs are no longer being considered. However, HUD/CHP and the MHEFA programs do represent viable financing resources. These two programs are summarized as follows:

U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT: COLLEGE HOUSING PROGRAM

The College Housing Program (CHP) has been appropriated $111 million for 1978. These funds must be allocated before the end of September, 1978.

a. The grant portion of the CHP is no longer available. Loans, however, are available at 3% interest over 40 years.
b. Application is made to and processing is done by the Area Office of HUD. Total time from application to approval and reservations of funds can be as little as six weeks.
c. A separate organization established to provide student housing is eligible for funding if certain criteria are met. This would imply that a non-profit corporation with Wentworth and Northeastern as members could apply for funding.
d. Apartment-type housing is eligible although it requires additional review and justification in terms of the local private housing market and the availability of rental apartments.
e. Approval of applications is based on and limited to facilities needed to alleviate an existing shortage in the supply of student housing. The applicant must make a strong case for a housing need and it is on this need that the application is approved or denied - not on the number of previous loans outstanding or similar considerations.
f. A form of collateral is necessary and may be a mortgage on the project or on other properties or investments.
g. Competitive bidding for project construction is a requirement although "package construction" may be undertaken which nonetheless requires bidding.
h. The maximum loan for any project is $7,500,000 although this will be adjusted given local building costs. The maximum per occupant cost is $14,000, also open to adjustment.

MASSACHUSETTS HEALTH AND EDUCATIONAL FACILITIES AUTHORITY

a. MHEFA is empowered to issue bonds and bond anticipation notes for the purpose of financing or refinancing construction and related projects at private colleges, universities and hospitals.

b. Neither the faith and credit nor the taxing power of the Commonwealth or any other political subdivision is pledged for any obligations issued by the Authority. Indebtedness is secured solely by revenues from the institutions for which the financing was undertaken.

c. Northeastern and Wentworth are unquestionably eligible borrowers. The Museum of Fine Arts may be because of the Museum School, but a determination on this would be necessary. If it is determined that the Museum is not eligible, financing can still be obtained but the Museum cannot be the actual borrower.

d. Joint projects involving two or more institutions are eligible as long as the borrower is an eligible educational or health institution.

e. Institutions pursuing a joint project may form a separate corporation in order to build and operate the project and that corporation could be eligible for MHEFA financing.

f. A single institution may build and operate the project, utilize MHEFA financing, and lease space to other institutions.

g. Student housing, parking and commercial space are all eligible for MHEFA financing, although in the case of commercial only when it is a minor element in the overall project.

h. There is no statutory ceiling to the amount of financing.

i. Other financing may be coupled with MHEFA financing including HUD's College Housing Program loans.

j. No architectural guidelines, minimum standards, or approval procedures are associated with MHEFA financing. Public bidding for contracting services is not required.

k. In order for MHEFA to seriously consider a proposal for financing, a guaranteed cost estimate must be submitted.

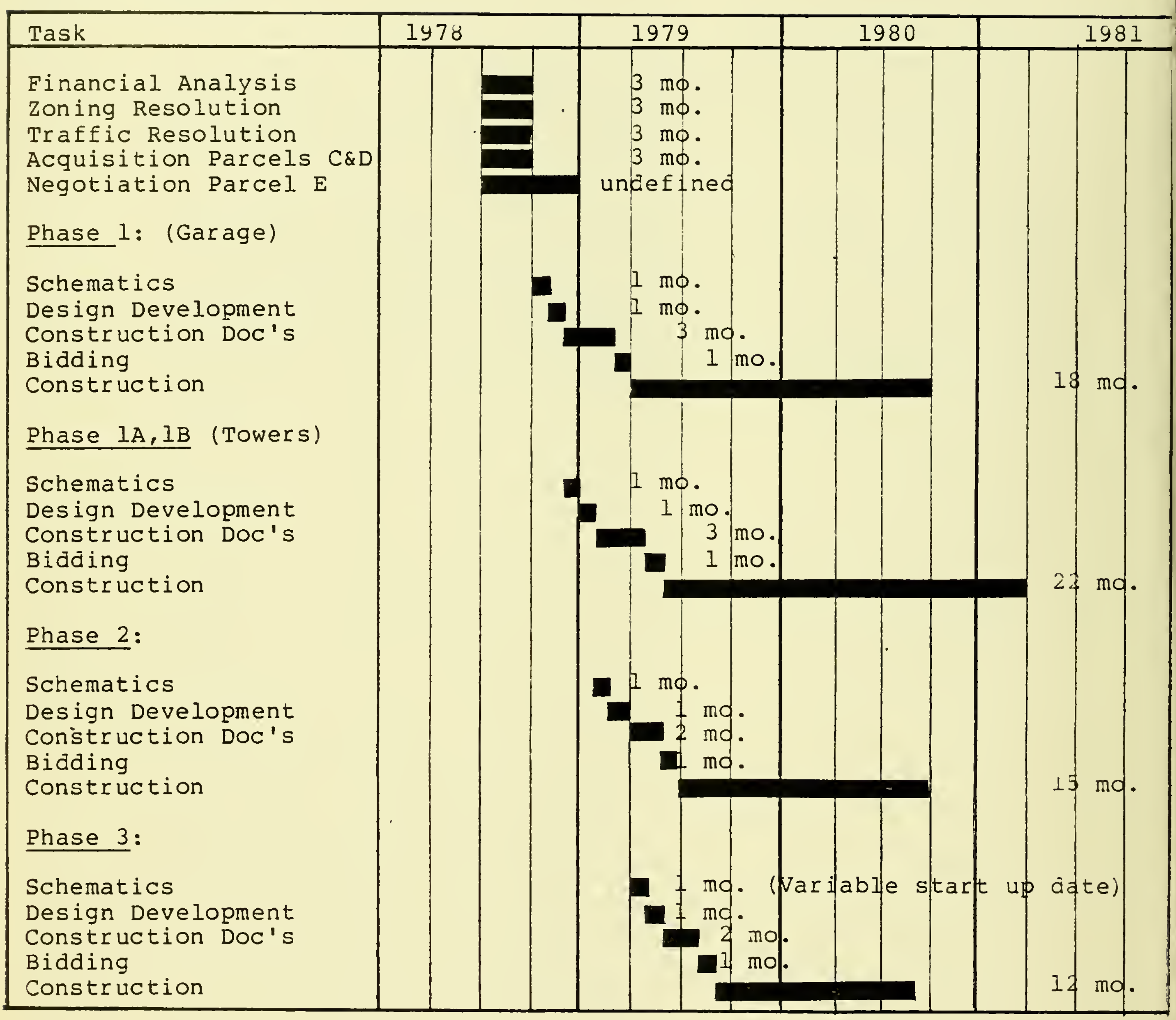
m. MHEFA processing time normally is between 4 or 5 months once the necessary financial data is in hand.

COMMUNITY PARTICIPATION

Another extremely important factor in the further development of Huntington Place reflects the need to involve various community groups throughout the decision making process of the project.

Preliminary Site Development Plans have already been presented to the Fenway Program Area Committee (FenPAC). The imput and support of FenPAC, an organization created by federal funds in conjunction with HUD's commitment to citizen participation in the development of Urban Renewal areas, will be critical during both the planning and implementation phases. Establishing open and continuous lines of communication will be essential.

PROJECT SCHEDULE



PROJECT SCHEDULE

The project schedule indicates four construction phases (1, 1A and 1B, 2, 3) that may result from the priorities established for the program elements in combination with a process that may finance these components incrementally.

The entire project schedule can be reduced significantly by reducing the number of construction phases. Real economies of construction can be realized by excavating the entire site and building the Phase 1 garage, residential towers, and Phase 2 housing at one time. In addition, reducing the number of phases will result in substantial savings in the cost of the mechanical, electrical, and plumbing systems and real savings will accrue due to the reduced time frame applied to escalating construction costs.

Several options regarding the programmed capacity and size of the second garage can still exist with this proposed consolidation of the phased sequences of construction.

Appendix

NORMAN A. ABEND
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304 CONCORD ROAD, WAYLAND, MASS. 01778
617-358-7095

TECHNICAL MEMORANDUM

Date: June 14, 1978
Subject: Huntington Place - Traffic Analysis

Background

This memorandum provides an evaluation and traffic engineering documentation supporting the proposed Huntington Place project. The conclusions are based on several periods of field observation, recent traffic counts, a compilation of traffic information available from various transportation planning sources, statistical and other information provided by the institutions involved in the project, and information obtained from the Southwest Corridor project.

The abandonment of the Southwest Expressway project several years ago created an inadvertently extended period of reduced trip generation and expanded parking supply that is now coming to an end. The extensive building demolition in the corridor adjacent to the current project site substantially reduced local trip generation and created an oversupply of parking. This allowed normal institutional growth to occur without the typically restrictive aspect of providing parking support. The Huntington Place development is one of the first to address this issue.

Traffic Volumes

Huntington Place is fortunate to be in an area of low-to-moderate traffic volumes. This is due in part to the limited width and traffic capacity of the street network and the existence of key sections of restricted capacity on major arterials leading to the site.

Exhibit 1 shows estimated 1978 Average Daily Traffic (ADT), while Exhibit 2 shows the turning movement flow at each corner of the Wentworth triangle. The highest volumes in the vicinity occur on the Fenway where the ADT is 25,000. In this area, both radial and circumferential trips use the Fenway parkways. Huntington Avenue has a surprisingly low volume for its nominal four lanes. Completion of the TOPICS program could result in an increase in volumes, probably without any noticeable effect on the site. Parker

Street is a short street, beginning at Tremont Street and ending at Huntington Avenue, a factor that will limit its traffic growth. For the section between Ruggles Street and Huntington Avenue, traffic growth will be small except that if Forsyth Street is ever closed to through traffic, Parker Street would end up carrying the through component. Even if this were to occur, Parker Street is capable of handling this added traffic since the total volume would still be less than its capacity. Removal of curb parking on both sides of Parker Street will allow the road to carry Forsyth Street traffic as well as serve the proposed garage.

The left turn back-up from Ruggles Street to Huntington Avenue westbound seems to be more a problem of design than traffic overload. Only 30 percent of Ruggles Street traffic makes this turn, a peak hour volume of about 150 vehicles. Casual observation does indicate an existing problem; however, the numbers indicate a loading that is capable of being handled in an improved design of the intersection, partially under the TOPICS program, and partially through a Ruggles Street widening.

Overall, the traffic volume situation in the Huntington Place area is not severe. In fact, the area is likely to see some above-average traffic growth as a result of programmed and proposed traffic improvements. None of these should have an adverse impact on the project since the design incorporates or leaves room for substantial traffic improvements along the border roadways.

Some concern has been expressed that the project, while mostly replacing existing parking, will have the effect of concentrating traffic at a single location and that this could create traffic problems for general traffic. The most intense concentration will occur at the entrance to the parking facility and will not necessarily worsen existing conditions at major intersections. There will be a transfer of specific trips and certain turning movements rather than a net increase in total volumes at any particular location. For example, in the new scheme, a vehicle approaching the Museum of Fine Arts from Ruggles Street would not have to travel through the Ruggles/Huntington intersection, but would enter the garage at Parker Street. Conversely, a vehicle approaching the Museum from the Charlesgate would have to cross Huntington Avenue. For about 380 spaces, the traffic pattern would remain exactly the same, since the access to this number of spaces is already on Parker Street.

The question of traffic concentration associated with the new garage is important at the intersection of Ruggles Street and Parker Street. A left turn lane from Ruggles into Parker Street toward the garage entrance should be part of any redesign or widening of Ruggles Street and has been incorporated into the alternative plans proposed for the Ruggles Street cross-town arterial.

Sources of Parking Demand

A unique aspect of the proposed development is that it is not a "growth" project. Most of the program elements constitute upgrading and replacement of existing facilities. Most, if not all, of the construction activity is associated with replacing deteriorating housing, locationally obsolete parking, or spaces that will be lost in the renewal process just beginning in this part of the city.

The two dormitories that will house 400 students in each tower constitute replacement of sub-standard and otherwise undesirable living accommodations for both Northeastern University and Wentworth Institute. An exact determination of whether such housing is actually a one-for-one replacement or whether the dormitories in effect increase the amount of on-campus student housing is not particularly relevant. If, in fact, the dormitories constitute additional on-campus housing for either institution, such housing represents a potential diversion of commuting students to on-site students, which would lead to a reduction in total trip-making, particularly during peak commuting hours. Within the scope of this project, it is not feasible to embark on a theoretical calculation of whether such housing would increase or decrease peak hour travel on the local street system, but it is fair to say that the dormitories, per se, do not constitute a significant increase in trip generation if, in fact, there is any increase at all.

The institutions are not projecting any increase in their enrollment capacities as a result of this project, nor are any of the three institutions projecting any increase in the total number of students at their facilities.

Similarly, the parking to be provided in the project is mostly replacement parking. However, there is a component of new parking demand created by the addition to the Museum of Fine Arts. This new wing, with construction to begin in 1978 and completion scheduled for 1981, will have the effect of reducing the available parking on the Museum grounds while increasing the activity at the Museum.

In Phase I, 710 spaces are provided. Of this number, approximately 270 represent replacement parking on the site itself, which is now occupied mostly by a parking lot. An additional 200± spaces represent a loss of parking at the Museum caused by the construction of the new wing and additional exterior modifications to create a new entrance associated with the addition. Another estimated 100 spaces are those that are currently on-street that will be lost through traffic changes in the area. For example, with access provided on Parker Street, it will most likely be necessary to restrict curb parking in the vicinity of the garage entrances. The TOPICS plan for Huntington Avenue will also result in the loss of some parking that will affect the supply generally available to the Museum.

The additional trips that the Museum will generate in the future will come from two sources: A direct increase in the gallery area which will increase the overall capacity of the Museum and will require some additional spaces; and, perhaps more significant, the gradual change in operating characteristics that the Museum is now experiencing. A greater emphasis on special exhibits, a trend that has been accelerating nationally in recent years, will become a more permanent component of museum activities. These special exhibits have special trip generation characteristics that are different from those of normal static displays. The net result is that daily visitorship will be permanently higher in the future. Parking problems have already surfaced during some recent and on-going special exhibits.

The additional parking proposed in Phase II would, to some extent, also be replacement parking. The site for the Phase II addition is now used by Northeastern to park 110 cars. (It is owned by the State.) Northeastern will also lose over 700 spaces in the near future as a result of Southwest Corridor construction. A proposed widening of Ruggles Street will result in an additional loss of spaces for Northeastern. Thus, even the projected addition of about 400 spaces in Phase II could represent replacement parking. Obviously, the loss of parking by Northeastern will be offset to some extent by the availability of public transportation. However, the automobile use is still expected to remain at a fairly high level in this part of the city. Exhibit 3 shows a summary of parking supply changes.

Allocation of Garage Spaces

No definite apportionment of spaces has yet been discussed among the member institutions; however, the following preliminary breakdown has been discussed: Wentworth, 300 spaces; Northeastern, 400 spaces; and the Museum of Fine Arts, 400 spaces.

The Museum demand is based on both employees and visitors. The use of automobiles for commuting by Museum of Fine Arts (MFA) employees is comparable to other institutions in the area. (See Exhibit 4.) One feature of MFA employee/volunteer demand is that many of them do not put in a normal five day week. Thus, total staff vs. daily staff numbers are different. While the Museum has a total staff size of about 400 people, only 300 come to the site on an average day. Applying a factor of .7 spaces per on-site staff member produces a staff parking demand of 210 spaces.

The demand created by visitors is much higher. A calculation based on current non-special exhibit patronage is shown in Exhibit 5. Assuming an annual attendance of about 600,000 people, there will be about 360 spaces needed to serve this demand. The visit period of two hours has been confirmed by entrance surveys, but the vehicle occupancy is estimated. The percentage of transit arrivals is not known, but it is considered to be not very high. Charter bus arrivals are mostly associated with the special exhibits and should not be factored into the calculation since "normal" patronage is used as the base.

Combining visitor and staff demands (and not adding a factor for Museum School students), the Museum has a need for at least 570 spaces, of which 400 will be met in the garage and the remainder by the resultant parking remaining in the Museum parking lot after the new wing and entrance is built. In the near future, the Museum's visitor volume is conservatively expected to grow by at least 100 percent, creating additional parking demand. Obviously, some dependence on on-street parking will still exist.

The remaining 700 spaces have been allocated to the dormitory portion of the project and to compensate for projected losses of parking. The 800 units of dormitory housing should probably require a ratio of .3 to .5 spaces per person, even though the vehicles owned by dormitory residents will not be used during peak hours. Assuming the lower value of .3 spaces per resident, the dormitories will use about 250 spaces of the 1,135 available in the new garage.

The remaining spaces, about 500, represent replacement of existing spaces that will be lost through upcoming transportation projects. Nearly all of the 1,135 spaces proposed in the total project represent spaces that will be lost in the near term future. Even with construction of this garage, the overall institutional program for the future shows a net decline in the parking supply.

Cross-Town Arterial Set Aside

Some type of circumferential role has been assigned to Ruggles Street for over 20 years. Originally planned as an "inner belt," several alternatives for this route have been studied but, as yet, no specific design has emerged with the necessary agency and local support to permit construction.

At the present time, the design concept is to create a "green belt" that would include provisions for a high capacity highway facility, pedestrians, bicycles and transit. A width of about 200 feet has been mentioned as needed to provide these transportation services. In duscussions concerning the cross-town arterial, the matter of traffic capacity has never been considered the principal reason for its construction, although increased capacity is certain to occur. The desire to create a green belt and a pedestrian/ bicycle route have also been cited as important considerations.

There is only a moderate amount of traffic on Ruggles Street now. (For the purposes of this report, Ruggles Street also includes the short section of Louis Prang Street between Huntington Avenue and the Fenway.) Ruggles Street ADT is about 14,000 vehicles, which is about the capacity of the street. On the other hand, traffic demand for a cross-town arterial has been shown in the past to be almost insatiable. Early studies of potential traffic on the "Inner Belt" showed an ADT potential in the six figure range. While such figures may not be realistic at today's reduced rate of traffic growth, it can be expected that any feasible increase in traffic capacity along Ruggles Street would be met in short order by an increase in traffic volumes.

Traffic volumes could easily rise to equal traffic carrying capacity of any roadway because of the latent demand for circumferential circulation. If there were specially designed segments of the cross-town arterial, they could have the effect of limiting its capacity. The Boston area still lacks a high capacity circumferential route and relies instead on several substitute arterial streets or combinations or radial travel. Creation of a new high capacity corridor would attract a number of these trips to the cross-town corridor along Ruggles Street.

Consequently, the traffic issue insofar as the Huntington Place project is concerned is what is a reasonable number of lanes to allow for traffic. At this point, a road cross-section that allows for two full lanes of moving traffic, plus separate left turn lanes, should be a reasonable response to demand for cross-town traffic. Ruggles Street now has a single lane in each direction and a partial left turn storage lane at Huntington Avenue. The proposed cross-section adds another full through lane in each direction which, along with the left turn lanes, would have the effect of about doubling the existing capacity of Ruggles Street.

A suggested cross-section is shown in Exhibit 6. A 60 foot curb-to-curb width has been used as a design standard in looking at alternative ways of treating a cross-town arterial through the project area. There would have to be additional width for sidewalks and a 40 foot transit right-of-way for future use as desired by the MBTA. The exact route of this 40 foot MBTA right-of-way is unclear, except that it will be included in the section of Ruggles Street between Huntington and the new Ruggles Street Orange Line station. At Huntington, this 40 foot reservation may continue toward the Fenway or turn onto Huntington Avenue westbound where there is already a transit reservation in the right-of-way.

For the purposes of this report, a 120 foot transportation corridor or its equivalent is recommended for inclusion in the site planning for Huntington Place. There would be additional "green space" on each side, but on private land that is now owned by the institutions.

A number of alternative treatments for the arterial are possible. Exhibits 7 through 10 show some that have been prepared for this report. Clearly, not all of them may be feasible, nor has the full range of alternatives been shown, but they point out some of the alternatives available. The 120 foot right-of-way appears to be acceptable from the standpoint of the project, abutters and a reasonable degree of traffic service.

Garage Feasibility Analysis

The financial feasibility of a garage is dependent upon three basic variables: the cost of the structure, the operating costs, and the income to be derived. Construction costs are the easiest to project, since the value is fixed initially by the bid price and other known variables such as financing rates. Even at this stage, cost estimates for construction can be obtained within a fairly narrow range.

Operating costs are subject to a greater range of estimates because they may vary based on several factors such as the method of operation, changes in utility rates, labor and insurance. For these figures, average values based on recent past experience have to be used.

Income projections are also dependent on decisions made about garage operation and the going rate for off-street parking. An added variable is the availability of competitive parking either in terms of location or price. One assumption in projecting income is that some spaces may be subsidized by the institutions. This can come in the form of charging lower parking rates for certain classes of users. However, it should be understood that any parker not paying full market rate for a space is, in effect, receiving a subsidy. This is a common practice, especially when garages are operated by large employers who set aside a portion of the supply for employee parking.

The market rate for off-street parking in the area is about $3.50 per day for all-day parkers and $1.00 per hour for short term users. Assuming a short term space is occupied 60 percent of the day (9:00 am to 5:00 pm), these spaces should produce about $5.00 per day. On the average, for preliminary feasibility analysis, each space should be worth about $4.00 per day, whether or not the institutions charge that price. The following analysis is based on this estimate of income.

Construction Cost @ $6,500/space

1,100 spaces @ $6,500 @ 8% interest
amortized over 20 years: Annual Cost: $720,000

Operating Costs, including Fixed and Variable: (not including taxes)

$ 225/space Annual Cost: $250,000

Total Annual Costs/Space:

$720,000 + $250,000 = $970,000 ÷ 1,100 = $ 880
Contingency Factor: 20% Use 1,050

Total Annual Income:

Assume 300 days @ $4/day/space x 1,100 spaces:
$1,320,000 $ 1,200/space

While the figures look good, certain things should be kept in mind:

1. There is no provision for taxes or payments in lieu of taxes.
2. Theoretical income from Northeastern and Wentworth parking devoted to dormitory and other users will probably have to be recouped from sources other than direct charges.
3. Museum of Fine Arts employees will probably be allowed to park at monthly rates that will be less than market rate.

On the other hand, the turnover spaces used by Museum visitors will probably produce over the average $4 per day. In sum, the figures look okay as long as it is recognized that a good part of the annual income will probably show up elsewhere and not from daily parking receipts.

Summary

This memorandum has touched upon those traffic and parking items that had to be evaluated as part of the feasibility study for the Huntington Place development. More detailed design and traffic flow estimates will be necessary when final plans are made. Certain conclusions, however, concerning the project can be made:

1. The construction of an 1,100 car garage does not represent a large increase in the local parking supply, but rather a consolidation of existing scattered spaces that will be lost in the near future.
2. The development will not be a generator of new traffic. The two dormitory towers represent in good part replacement and upgrading of obsolete buildings. The commercial space, by its small size and location, will be devoted to local service and is not the type that will generate automobile trips.
3. Access to the site is excellent because it is bounded on all sides by arterial streets. Huntington Avenue is scheduled for a TOPICS project to improve capacity and safety. Ruggles Street is expected to be the route for a new cross-town arterial. Parker Street is a short arterial segment with limited traffic growth potential.

These factors indicate that the development is situated in an ideal location in relation to the circulation system in the Fenway area. This accessibility, combined with primarily replacement type construction, raises traffic and parking issues that should be easily resolved.

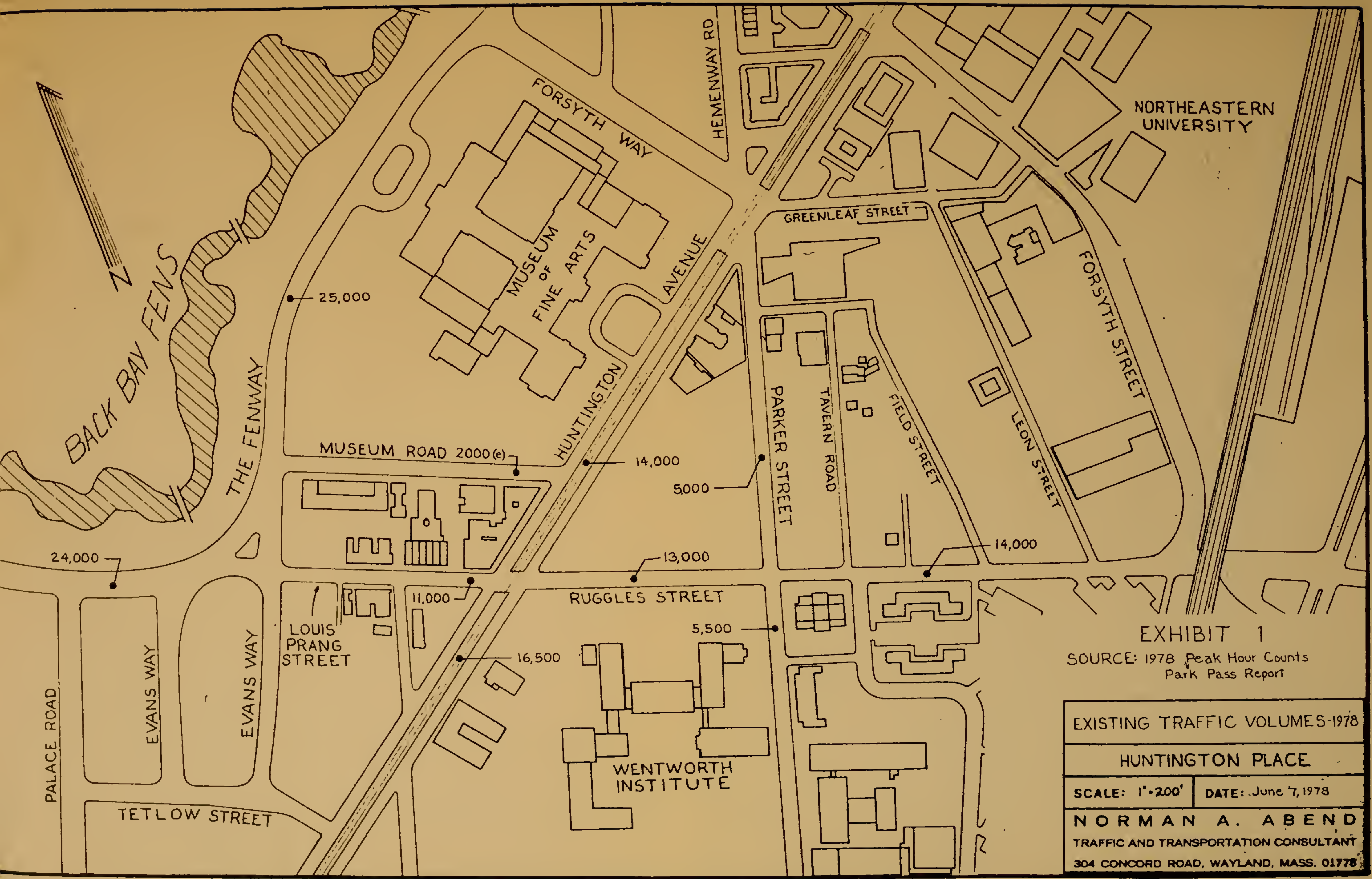

EXHIBIT 1

SOURCE: 1978 Peak Hour Counts
Park Pass Report

EXISTING TRAFFIC VOLUMES-1978

HUNTINGTON PLACE

SCALE: 1"=200' DATE: June 7, 1978

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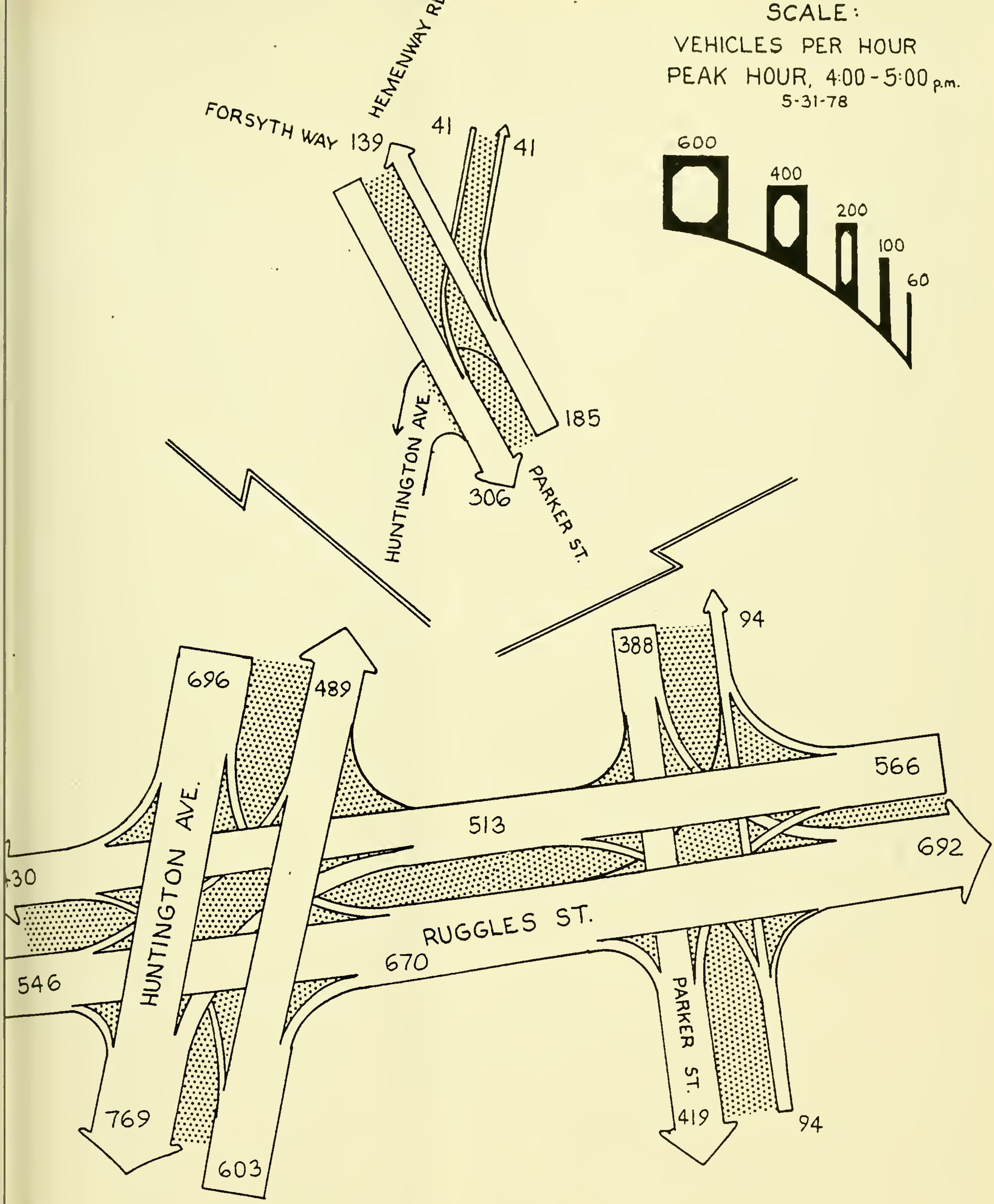

EXHIBIT 2

TURNING MOVEMENT DIAGRAMS

NORMAN A. ABEND

Traffic and Transportation Consultant

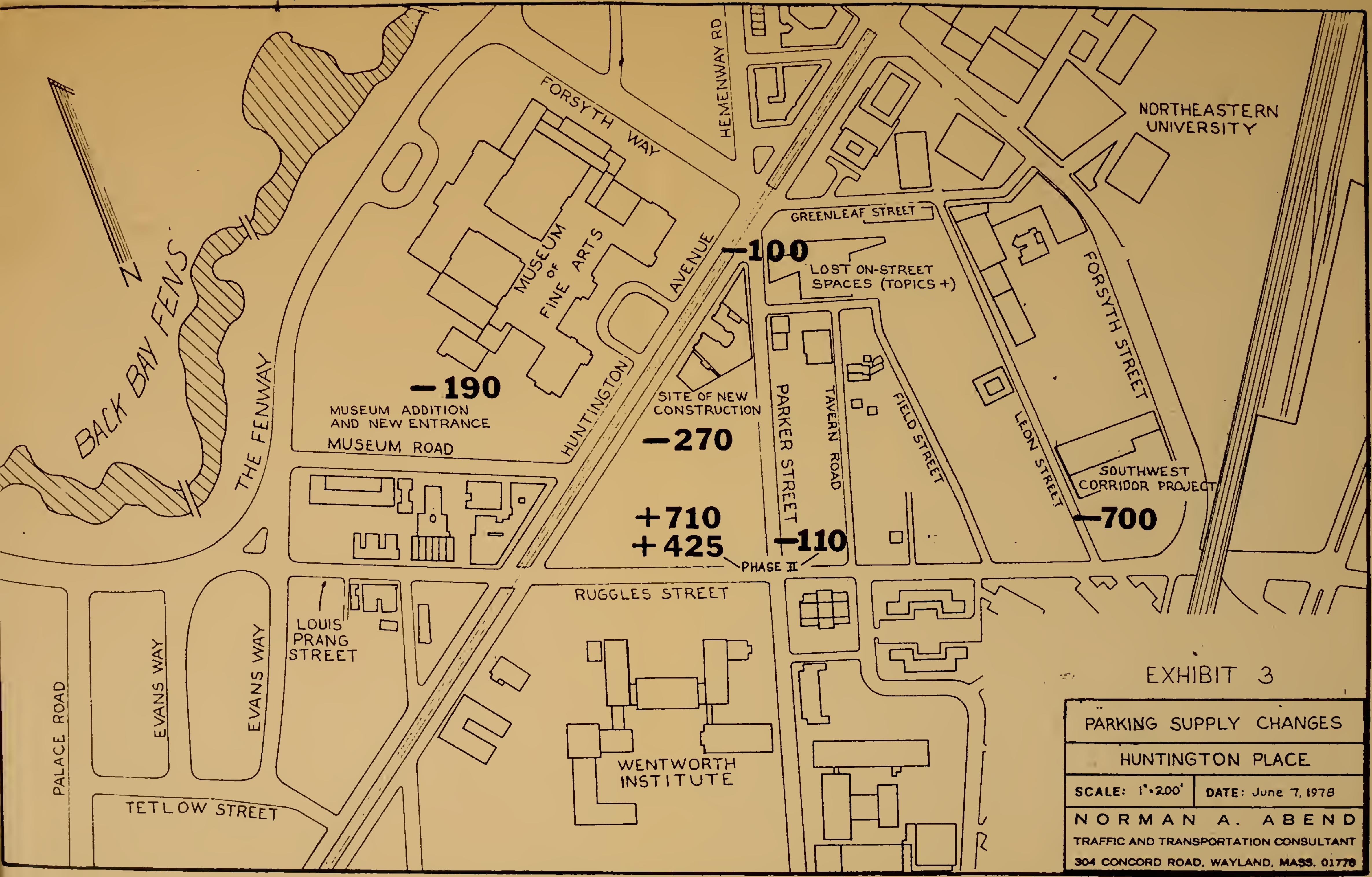

EXHIBIT 3

PARKING SUPPLY CHANGES

HUNTINGTON PLACE

SCALE: 1"=200'
DATE: June 7, 1978

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EXHIBIT 4

MODE OF COMMUTING - MUSEUM OF FINE ARTS EMPLOYEES

Mode	No.	%
Drive alone	267	73
Public Transportation	22	6
Car Pool and Drop	71	19
Walk	7	2
TOTAL	367	100%

Source: Museum of Fine Arts Employee and Volunteer Questionnaire

EXHIBIT 5

MUSEUM VISITOR DEMAND

2,000 visitors in seven (7) hours

Assume average car occupancy = 2

Assume two hour stay = 3.5 turnovers

2,000 ÷ 2 ÷ 3.5 = 286 spaces

Add factor for peaking: 25 %

Gross Visitor Space Demand:

286 x 1.25 = 358 Spaces

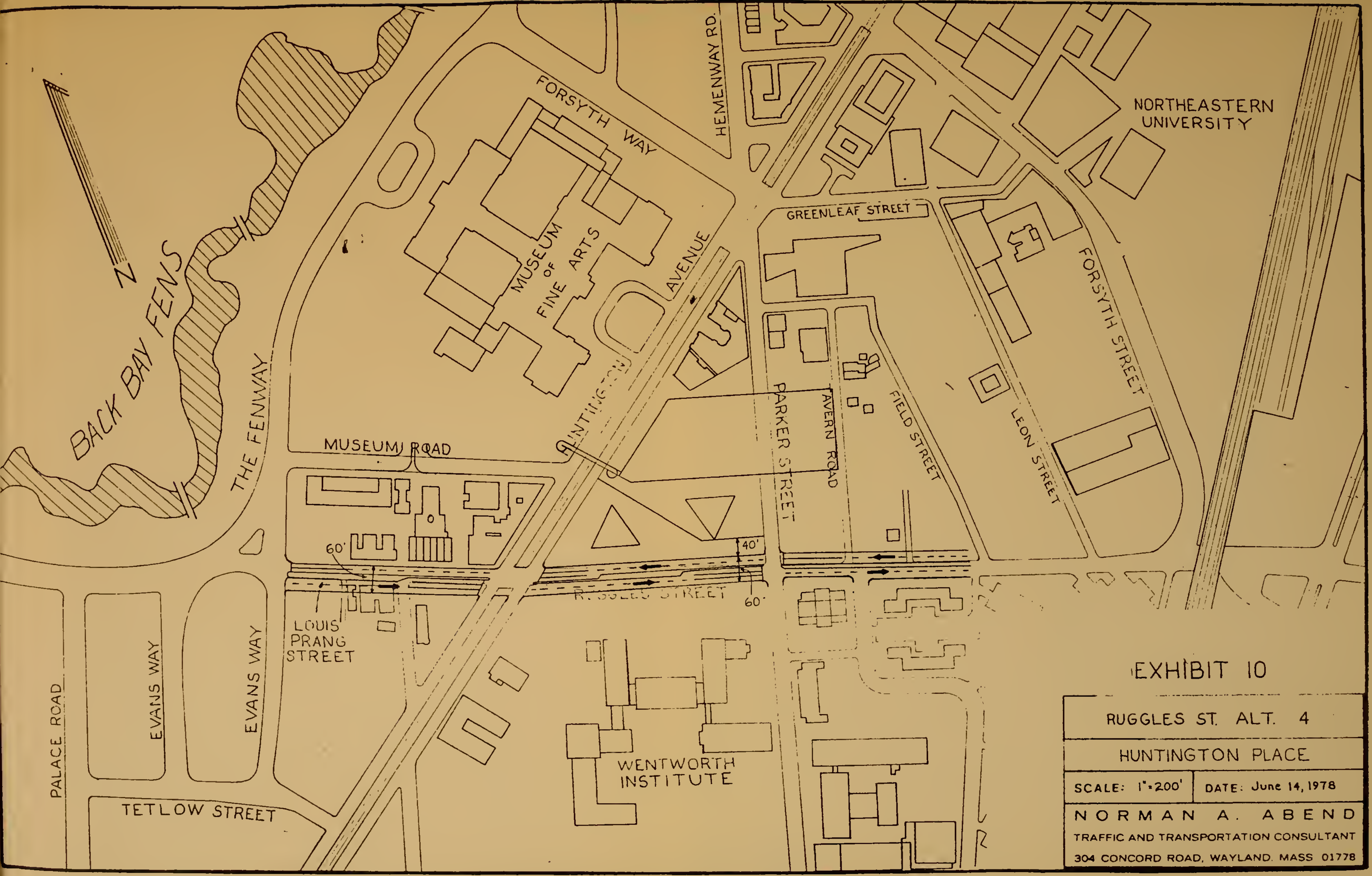

EXHIBIT 10

RUGGLES ST. ALT. 4

HUNTINGTON PLACE

SCALE: 1"=200' DATE: June 14, 1978

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CROSS SECTIONS - RUGGLES STREET

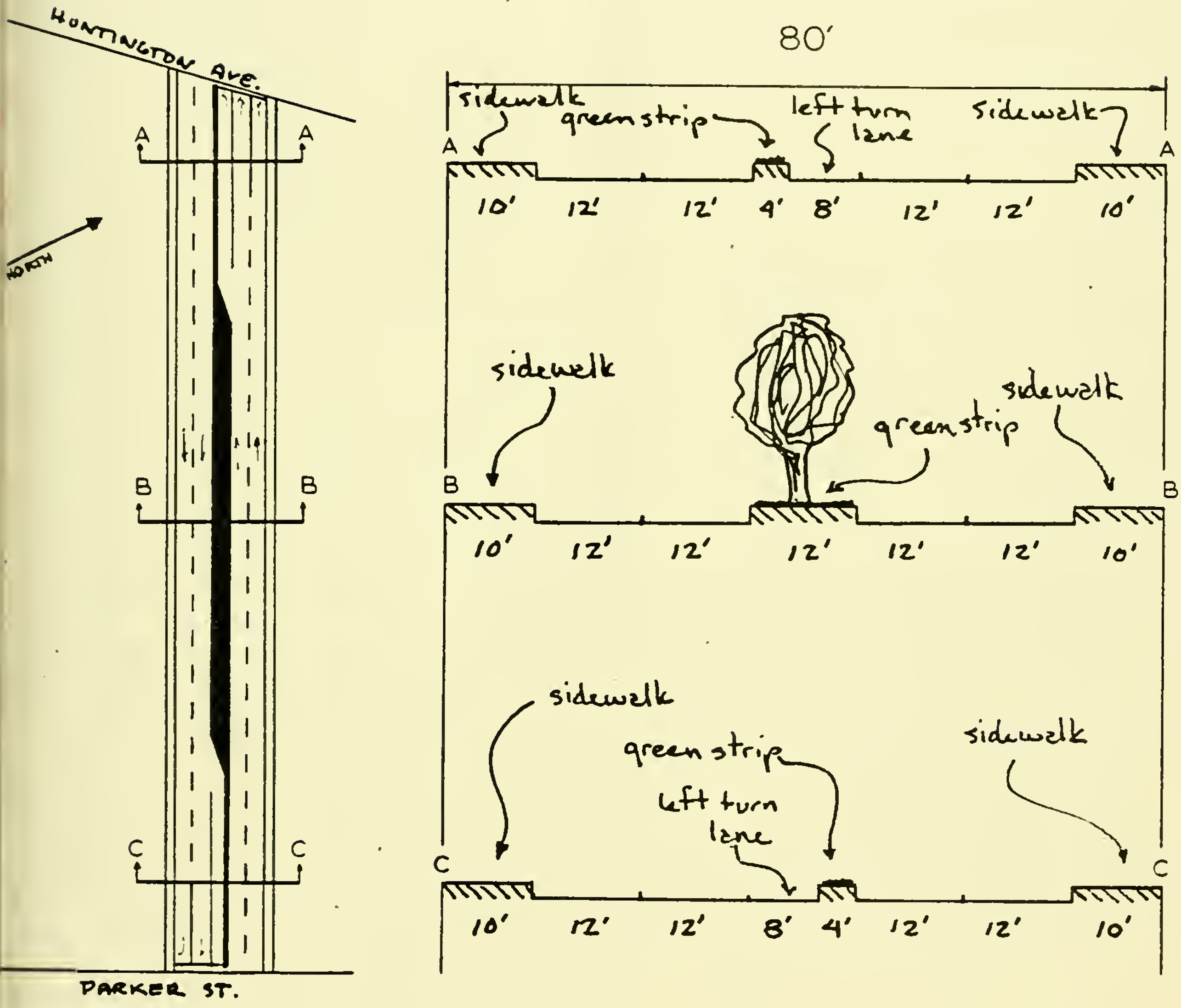
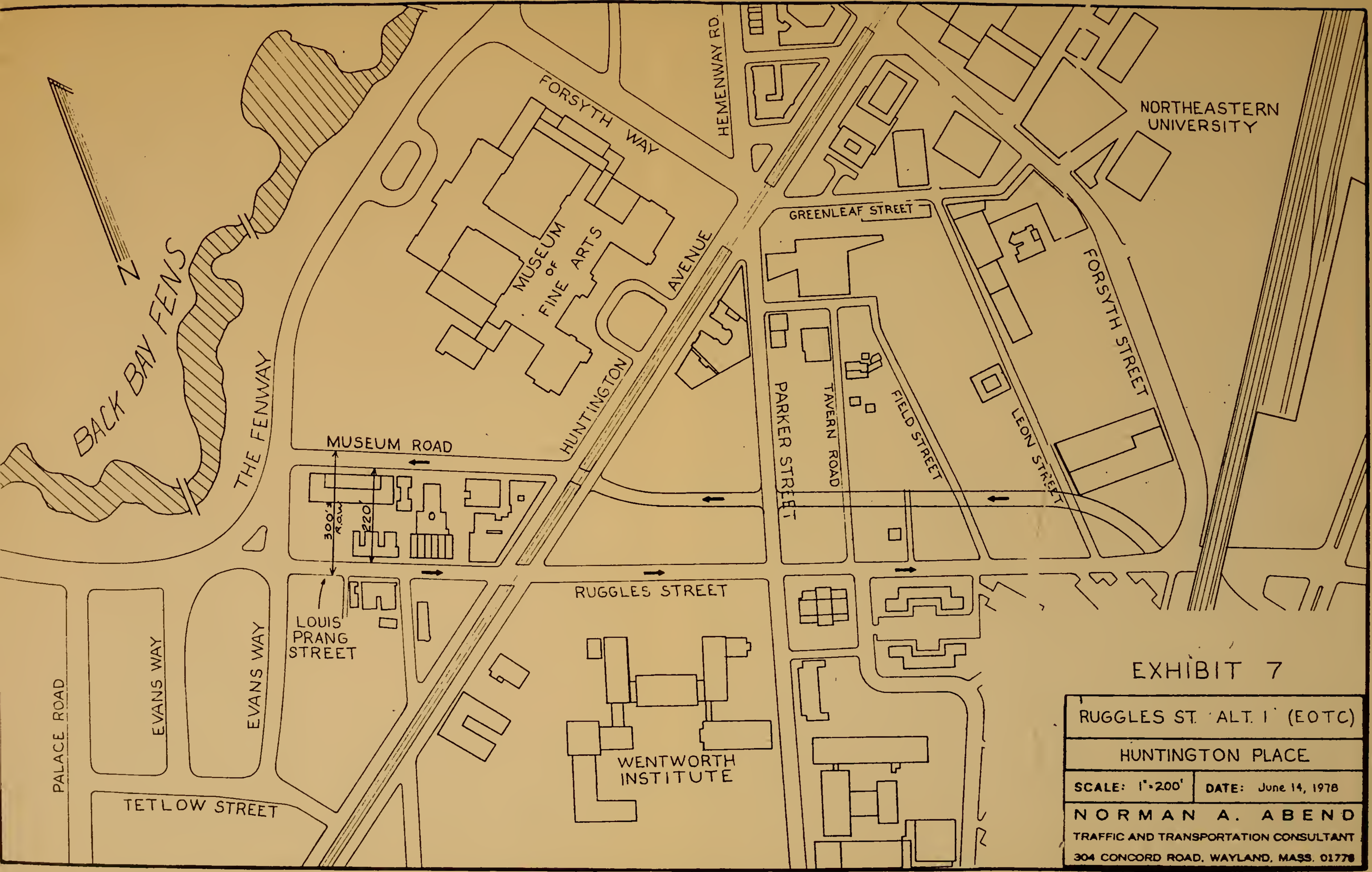


EXHIBIT 6

EXHIBIT 7



RUGGLES ST. ALT. I (EOTC)

HUNTINGTON PLACE

SCALE: 1"=200' DATE: June 14, 1978

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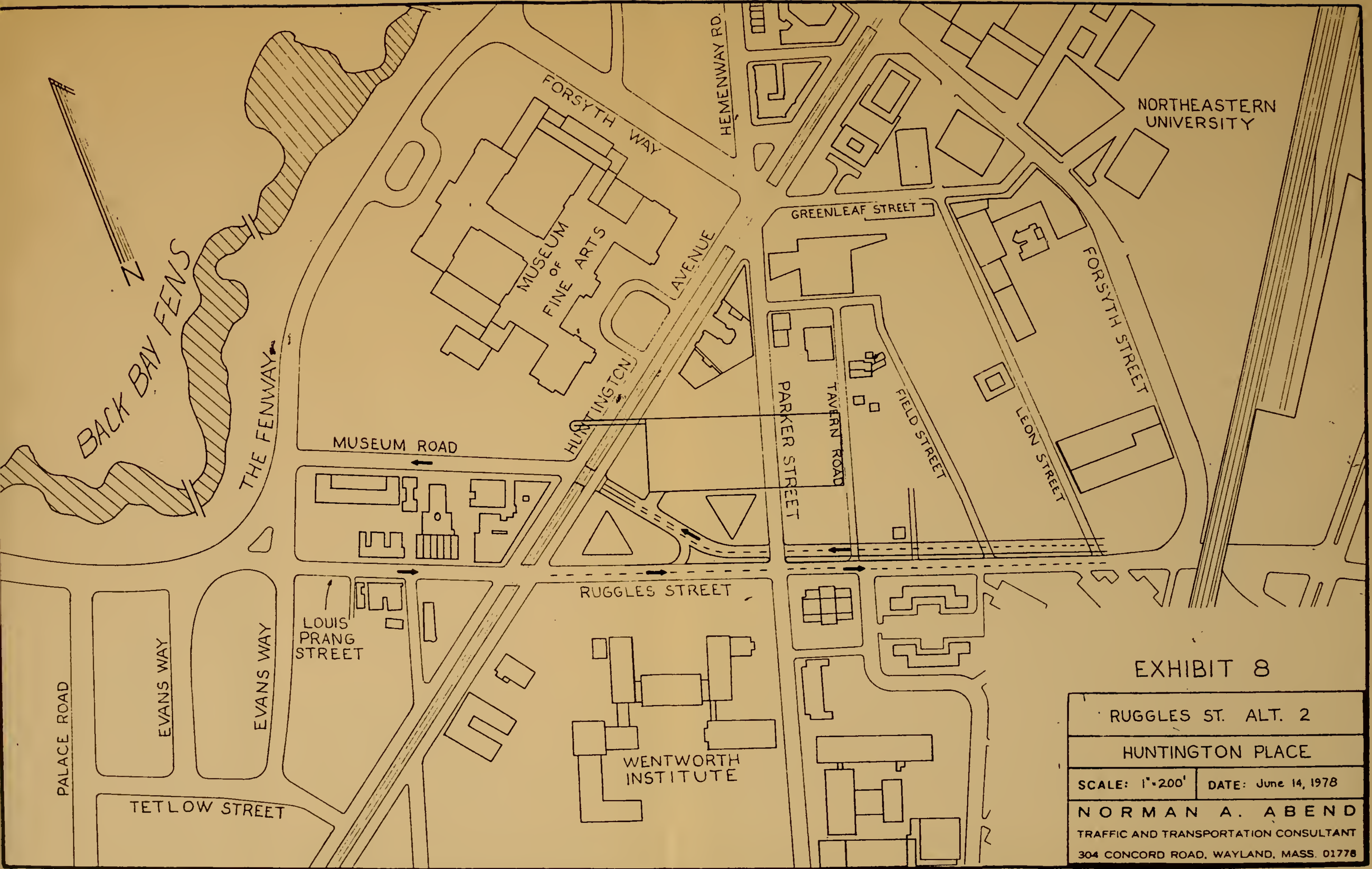

EXHIBIT 8

RUGGLES ST. ALT. 2

HUNTINGTON PLACE

SCALE: 1"=200'
DATE: June 14, 1978

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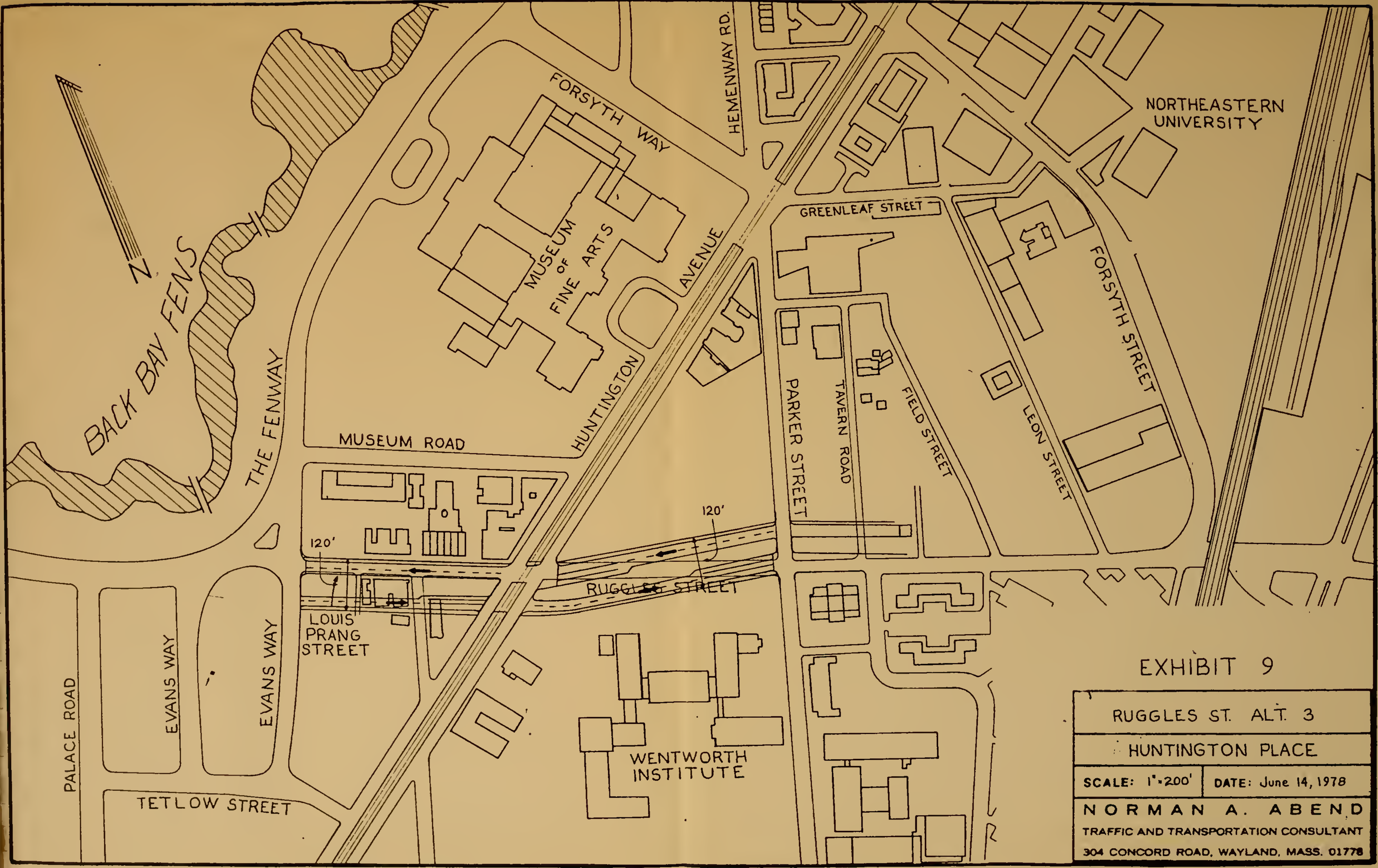

EXHIBIT 9

RUGGLES ST. ALT. 3

HUNTINGTON PLACE

SCALE: 1"=200'
DATE: June 14, 1978

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McPHAIL
ASSOCIATES, INC.
1033 MASSACHUSETTS AVENUE • CAMBRIDGE, MA.
(617) 868-1420

June 6th, 1978

LeMessurier Associates/SCI
1033 Massachusetts Avenue
Cambridge, Massachusetts 02138

Attention: Mr. H. William Hagen

Reference: Huntington Place Feasibility
Preliminary Foundation Design and Construction Considerations

Gentlemen:

The intent of this letter is to present anticipated subsurface conditions at the Huntington Place site and, based on these conditions, discuss preliminary foundation design and construction considerations as they pertain to the feasibility of the proposed 18-story towers and the seven-level parking garages.

ANTICIPATED SUBSURFACE CONDITIONS

This reclaimed site is essentially flat with existing ground surface being about Elevation + 17 (Boston City Base). Based on a preliminary review of available soil boring data in the general area, the following simplified subsurface profile is anticipated. The site is underlain by about 15 feet of miscellaneous granular fill which, in turn, is underlain by approximately 15 feet of soft organic silt and/or peat. At a depth of 30 feet, a three-foot stratum of compact sand and gravel is anticipated.

Next in the sequence is an extremely thick deposit of Boston blue clay extending to a depth of almost 200 feet below ground surface. Typically, the top of the deposit consists of a stiff yellow clay which, with increasing depth, becomes softer and more compressible. It is anticipated that the stiff clay crust is relatively thin in comparison to most other areas in the Boston vicinity where the blue clay deposit in found. Below the clay is a very dense glacial till at least 70 feet in thickness which overlies bedrock consisting of a sedimentary shale-like material known as Cambridge argillite. Groundwater is anticipated at a depth of about ten feet (i.e. Elevation +7).

The following discussion of preliminary foundation design and construction considerations, as it pertains to feasibility of the proposed towers and garages, is predicated upon the above anticipated subsurface conditions being reasonably accurate for the entire site.

(Continued to Page -2-)

18-STORY TOWERS

(a) Foundation Design Considerations

In consideration of the unsuitable bearing materials to a depth of 30 feet and in consideration of the underlying thick compressible clay deposit, the 18-story towers should be designed with a sub-basement slab about 27 to 30 feet below ground surface so that a mat foundation (designed for a uniform reaction) can bear directly on the compact sand and gravel stratum or on the top of the underlying clay deposit. The sub-basement should have interior structural walls to minimize the span of the structural mat. Exterior foundation walls should be designed for equivalent fluid pressures corresponding to densities of 60 and 90 pounds per cubic foot above and below, respectively, Elevation +10.

The mat and exterior foundation walls should be waterproofed to Elevation +10. Metallic waterproofing on the interior surfaces is recommended.

It is technically feasible to avoid the sub-basement (and the basement for that matter) by utilizing an extremely deep pile foundation. A 100 ton capacity, 14 inch square, precast prestressed concrete pile could be utilized assuming a spliced 200-foot length at a subcontractor's cost of $20 per foot. Since the cost of the deep pile scheme is prohibitive, the following discussion of foundation construction considerations pertains only to the mat foundation scheme.

(b) Foundation Construction Considerations

Due to the proximity of site boundaries and in consideration of both dewatering costs and the potential adverse effects on surrounding properties of dewatering, construction of the mat foundation should be within an interior braced steel sheet pile cofferdam. The sheeting should be driven into the top of the stiff clay to ensure a reasonable groundwater seal, thereby resulting in only minor sumping from within the cofferdam. Two levels of interior bracing should suffice and the elevation of these bracing levels can be selected such that the bracing can be removed during foundation construction, hence, avoiding interferences with the forms and penetrations through the foundation walls. Further, the triangular configuration lends itself to efficient internal bracing with a relatively large unobstructed area in the central portion of the excavation.

Either continuous sumping from within the cofferdam or flooding of the sub-basement and basement would be required to avoid excessive hydrostatic uplift until the building achieves sufficient strength and dead load to resist these pressures.

(Continued to Page -3-)

7-LEVEL GARAGES

(a) Foundation Design Considerations

In consideration of the unsuitable bearing materials (existing fill and organic soils) at shallow depths, the garages should be assumed to be supported by belled caissons bearing on the top of the thin sand and gravel stratum at a depth of 30 feet below ground surface. A bearing value of three tons per square foot should be utilized in the design and a maximum bell diameter of twelve feet with a two foot undercut should be assumed.

For this foundation scheme to be feasible, the garages must have one below-grade parking level, ideally at seven or eight feet below ground surface. This below-grade level should be bituminous concrete underlain by a two foot thickness of compacted gravel fill. A foundation underdrainage system is required.

(b) Foundation Construction Considerations

Installation of the caissons should be from a general excavation about eight feet below ground surface. The general excavation would facilitate removal of any existing foundation walls, slabs, and wood piles which would obstruct the caisson work. A system of deep wells to the top of the clay would be required to alleviate the hydrostatic pressure in the thin sand and gravel bearing stratum prior to caisson installation. Further, an allowance of about ten percent of the basic caisson contract cost should be carried to provide for minor belling difficulties in the organic soils immediately overlying the bearing stratum.

We trust that the above discussion of preliminary foundation design and construction considerations will be helpful in your feasibility study for the proposed Huntington Place. Should additional information be required, please call us.

Very truly yours,

McPHAIL ASSOCIATES, INC.

Robert E. McPhail

Robert E. McPhail, P. E.

REM:crb

LeMessurier Associates / SCI

1033 Massachusetts Avenue, Cambridge, Massachusetts 02138

William J. LeMessurier
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Franz R Schemmel
Robert V Minchello
Salvatore G Mazzotta

6 June 1978

Hugh Stubbins and Associates, Inc.
1033 Massachusetts Avenue
Cambridge, Massachusetts 02138

Attention: Mr. Richard Green

Reference: Huntington Place Feasibility Study
LeM File No. 9497

Gentlemen:

The purpose of this letter is to describe the various structural systems and associated quantities for the proposed housing (high-rise and low-rise) and two parking garages. Preliminary structural studies were made based on the current requirements of the Massachusetts State Building Code.

Housing

The high-rise housing consists of two towers each of which has eighteen (18) stories and a penthouse above grade, and two (2) basements below grade.

Superstructure framing as proposed for each tower consists of structural steel moment-resisting frames plus composite floor beams, (with headed stud shear connectors) and results in a structural steel weight of approximately 14.5 pounds per square foot of framed area. Depending upon the type of ceiling used the structural steel may or may not have spray-on cementitious fireproofing.

Roof and floor slabs take advantage of the composite capabilities of steel and concrete by using a composite slab system. This system has a total depth of 5-1/4", and is composed of 3-1/4" lightweight concrete topping (3000 psi) with welded wire fabric and 2" (18 gage) galvanized corrugated steel deck.

Foundations for each tower would require an excavation of approximately 33 feet from existing grade. Construction of the founda-

tion would involve using 3000 psi normalweight concrete and 60 ksi reinforcing steel for the 3 ft. thick mat (250 #/cy, i.e., 250 pounds of reinforcing steel per cubic yard of concrete), 16" thick exterior foundation walls (150 #/cy) and 18" thick cross-walls in the lower basement.

The low-rise housing would be constructed in a manner similar to the high-rise.

Parking Garage No. 1

Parking Garage No. 1 has six (6) framed levels above grade, (five parking levels plus one recreation deck at roof level), one framed parking level at grade and one parking level on bituminous concrete below grade. Traffic circulation between levels is provided by one straight up/down ramp.

Superstructure framing of the seven (7) framed levels consists of two-way post-tensioned normalweight concrete (4,000 psi). The roof and floor post-tensioned beams will be 12" x 36" (14 - 1/2" dia. 270 ksi strands) and the slabs 6" thick (1/2" dia. 270 ksi strand at 24" on center). This horizontal framing system will also require mild reinforcing steel (60 ksi) amounting to 1.5 #/sq.ft. Columns will have an average size of 16" x 24" and reinforcing steel with an average of 250 #/cy.

Foundations for Parking Garage No. 1 will use 3000 psi normalweight concrete, 60 ksi reinforcing steel for the 12" thick foundation walls (150 #/cy) and 23' long belled caissons. Fifty of these caissons require a 6 ft. dia. shaft with a 10 ft. dia. bell, and 20 require an 8 ft. dia. shaft with a 12 ft. dia. bell.

Parking Garage No. 2

Parking Garage No. 2 is arranged using split-level trays whereby traffic circulation between parking trays is provided by two straight ramps, up at one end, down at the other. Five full framed parking levels are above grade, one-half parking level is at grade and one parking level on bituminous concrete is below grade.

Superstructure framing of the five-and-one-half framed levels consists of a combination of precast/prestressed double tee floor members (8' nominal width, 2'-8" deep; 4" topping slab, 4" min. stem width spaced at 4'-0"; 1" jointing for crack concrete "Isoflex 880 Sealant") and cast-in-place concrete for edge beams, shear walls, columns, and ramps (190 #/cy).

Foundations for Parking Garage No. 2 will use 3000 psi normalweight concrete and 60 ksi reinforcing steel for the 12" thick foundation walls (150 #/cy) and 23 ft. long belled caissons. Thirty-five of these caissons require a 6 foot dia. shaft with a 10 ft. dia. bell, and twelve require an 8 ft. dia. shaft with a 12 ft. dia. bell.

We hope that the above comments on the preliminary structural design of the superstructure and foundations will be useful in your feasibility study for the proposed Huntington Place. If you require further clarification of any items, please call us.

Very truly yours,

LeMESSURIER ASSOCIATES/SCI

HW Hagen

Hans William Hagen, P.E.

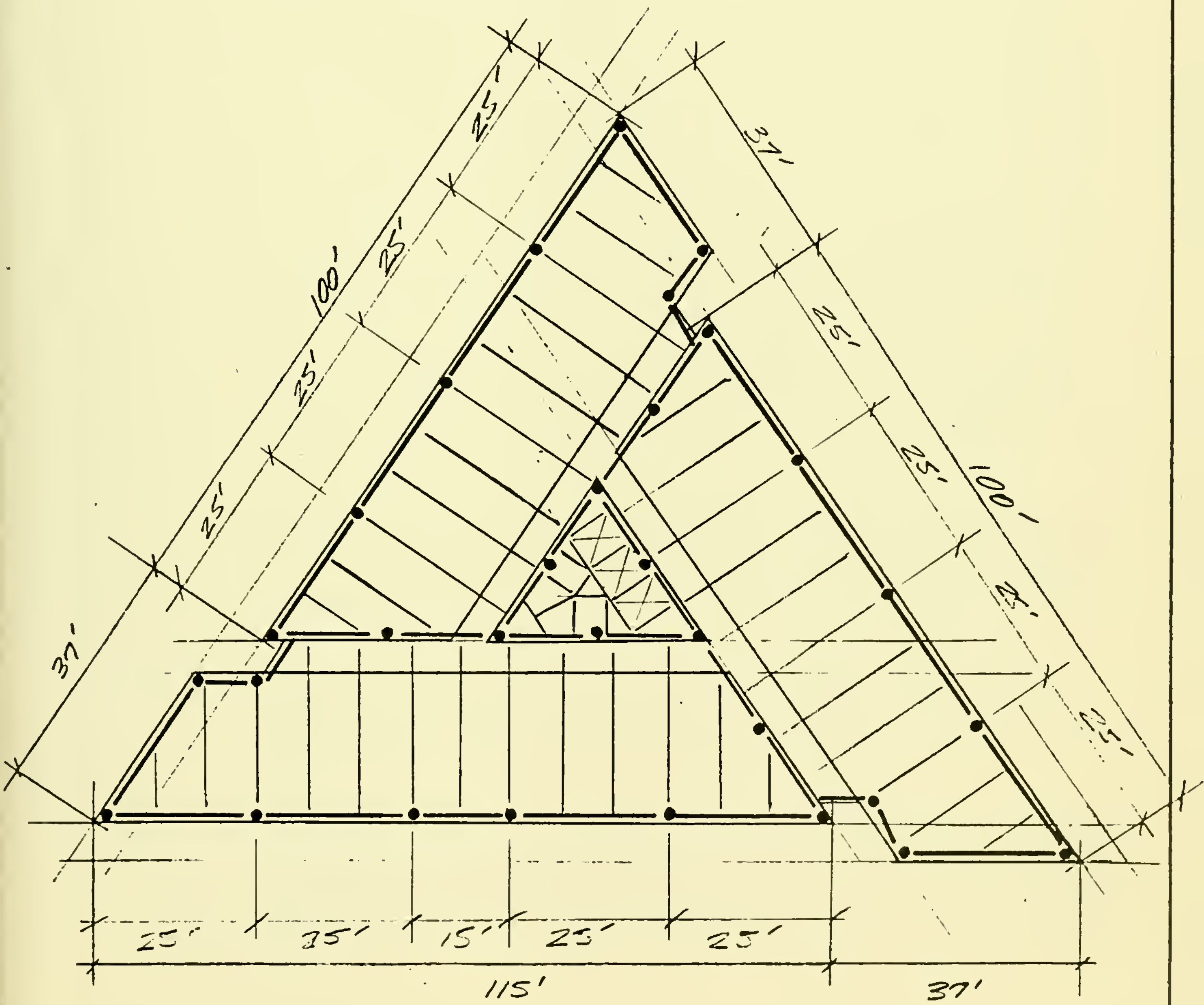
HWH:mwv

LeMessurier Associates/SCI

Subject HUNTINGTON PLACE
STEEL FRAMING
SCHEME

Made by RAH
Checked by
Approved by

Job No 9497
Date 5/23/78
Sheet No.



Shooshanian Engineering Associates

129 Malden Street
Boston
Massachusetts 02118
617 426 0110

Edward Shooshanian
Ray B. Stevens
Henry J. Eggert
Ernest S. Durb Jr.
Joseph J. Barbera

13 June 1978

Hugh Stubbins & Associates
1033 Massachusetts Avenue
Cambridge, MA 02138

Attention: Mr. R. Green

Subject: Huntington Place

Gentlemen:

In accordance with your request, we are submitting the following summary of services proposed for the subject project:

Heading, Ventilating and Air Conditioning

Parking garages will be unheated. Above ground portions of the garages will be naturally ventilated through wall openings. Lower portions of the garages will be mechanically exhausted to prevent contamination of the air from engine fumes.

Hot water for heating and chilled water for cooling will be provided to each commercial area. Heating and air conditioning equipment for these areas will be installed by the tenants to suit their various requirements.

Dormitories will be heated and air conditioned by means of vertical fan coil units. Hot water, chilled water and drain piping will be factory installed within the units to allow connection to units on the floors above and below with a minimum of external piping. The units will maintain desired room temperatures automatically.

Provisions will be made to exhaust all toilets, kitchens and service areas mechanically. The stair towers will be provided with emergency ventilation systems to allow safe evacuation of the building.

The ground floor of each dormitory building will be air conditioned by means of central air units to allow intermittant operation as required for occupancy. Heating of these areas will be accomplished by means of perimeter radiation, independent of air conditioning, and capable of maintaining reduced temperatures during unoccupied hours.

Primary heating will be accomplished by means of low pressure steam supplied by oil fired boilers. The boiler room will be located in one of the dormitory tower buildings. If the garage/commercial building is built prior to the construction of one of the dormitory tower buildings, a small boiler will be installed for interim service to the commercial area.

Provisions will be made to distribute steam underground from the dormitory tower boiler room to the other dormitory tower and to garage/commercial building. Piping will be large enough for extension to the dormitory/commercial building.

Two boilers will be required to provide adequate capacity for service with stand-by capabilities for one dormitory tower and the garage/commercial building. A third boiler is required for service to the second dorm-tory tower, and will provide sufficient capacity for future extension to the dormitory/commercial building.

Steam will be supplied to a domestic hot water heater and a heating hot water convertor in each building. Hot water will be pumped throughout each building to individual heating/cooling units in each area.

Cooling will be accomplished by means of chilled water supplied by central refrigeration chillers, with heat rejection to mechanical cooling towers. The chillers will be located in a mechanical room in one of the dormitory tower buildings. If the garage/commercial building is built prior to the construction of one of the dormitory buildings, an air cooled packaged water chiller will be installed for interim service to the commercial area.

Provisions will be made to distribute chilled water underground from the dormitory tower equipment room to the other dormitory tower and to the garage/commercial building. Piping will be large enough for extension to the dormitory/commercial building. Chilled water will be distributed throughout each building to individual heating/cooling units in each area.

Two chillers with suitable cooling tower sections will be required for service to one dormitory tower and the garage/commercial building. A third chiller and additional cooling tower sections will be required for service to the second dormitory tower, and will provide sufficient capacity for future extension to the dormitory/commercial building.

Fire Protection

Garages shall be equipped with a standpipe system in each stairwell with a fire hose cabinet and fire department valve at each level. All levels below ground and all levels above the sixth floor shall be equipped with a sprinkler system.

Each dormitory shall be equipped with a standpipe system in each stairwell with a fire hose cabinet and fire department valve at each level. Each dormitory shall be equipped with a sprinkler system throughout.

Commercial spaces shall be provided with capped connections for sprinklers which will be installed by the tenant of the space as it is completed.

Plumbing

Garages shall be equipped with drainage facilities, domestic cold water and domestic hot water. The drainage systems shall be separate storm and sanitary systems discharging to the street mains. The domestic water systems shall be limited to employees' toilet facilities. Hot water will be generated by an electric storage heater located within the employees' toilet facility.

Each dormitory shall be equipped with drainage facilities, domestic cold water and domestic hot water. The drainage systems shall be separate storm and sanitary systems discharging to the street mains. The domestic cold water system shall be distributed to all toilet rooms, kitchens and laundry facilities. The domestic hot water system shall include two steam fired hot water heaters located in the basement, the distribution system shall be the same as the domestic cold water system.

Commercial spaces shall be provided with capped drainage and cold water connections which will be extended to toilet facilities provided by the tenants of the spaces as they are completed.

Electrical

Parking garages will be provided with high pressure sodium lighting in the parking areas and pole mounted high intensity discharge lighting for the roof tennis courts. The phase 1 parking garage will contain the service entrance facilities for the entire complex. Also in the phase 1 parking garage will be the emergency stand-by generator for the entire complex.

Each commercial space will be provided with a separate service, metering, panelboard, telephone service conduit, general fluorescent lighting, receptacles and emergency lighting battery units.

Dormitories will be provided with ceiling and wall lighting, receptacles, switching, power for kitchen equipment and living room telephone outlets. A master antenna television system with outlets located in each living room, lounge and recreation area will be provided to receive and distribute all commercial channels. Each dormitory unit will be provided with an apartment communication system to allow voice communication to the lobby master station and lobby door release. Emergency lighting will be provided in all corridors, stairs and lobbies.

All buildings and areas will be provided with a complete fire alarm system. The system will detect heat, smoke or the operation of the building sprinkler system and automatically transmit a signal to the Boston Fire Department, and all building signals. The system will also be provided with manual operation capabilities, and battery stand-by.

An emergency stand-by system will be provided to all buildings from a single diesel driven generator set to be located in the phase 1 parking garage. In addition to emergency lighting in all buildings and areas, except the commercial spaces, the emergency system will power a fire pump and one elevator in each building. The generator will be controlled by an automatic transfer switch at each building electric service location. The emergency electrical system will be a completely separate system to and within each building, at 120/208 volt, 3 phase, 4 wire.

The normal electrical service and distribution system will be provided from a single underground service entrance location at the phase 1 parking garage to a transformer vault in each building at 13.8 KV. The system will have a single primary metering facilities for all electrical energy except that used by the commercial spaces. Each building will be provided with its own transformer, switchboard and distribution feeders to panelboards on each floor. Distribution within the buildings will be 120/208 volt, 3 phase, 4 wire.

An underground telephone service will be provided to a telephone service equipment room in the phase 1 parking garage with additional underground conduits to each building. Telephone outlets in each area will be connected to terminal cabinets on each floor. The telephone cabinets will be, in turn, connected to each building's telephone equipment location at the building service entrance.

Electrical connections will be provided for all heating, ventilation, air conditioning and plumbing equipment for power and control requirements.

Very truly yours,

SHOOSHANIAN ENGINEERING ASSOCIATES, INC.

Joseph G. Fullam, P.E.

GEORGE B. H. MACOMBER COMPANY BUILDERS

June 13, 1978

Hugh Stubbins & Associates, Inc.
1033 Massachusetts Avenue
Cambridge, Massachusetts

Attention Mr. Richard Green

RE: Proposed Huntington Place Development

Gentlemen:

We have carefully reviewed the small scale schematic site plan and typical floor plan which you sent to us on June 8th and which you have discussed in some detail with our Chief Estimator, Mr. Norman Whiting.

We have compared the proposed residential towers to the Symphony Towers apartments which we are presently constructing on the corner of Mass. Avenue and Huntington Avenue, which are also of steel frame as proposed here, making appropriate adjustments for the triangular shape, the different distribution of bedrooms, bathrooms and amenities, the foundation conditions and the site work.

We have compared the Phase I Garage with the Deaconess Hospital Garage on Longwood Avenue now being constructed, on which we were the second bidder, and with the Affiliated Hospital Servicenter Garage on which we are about to start construction on Francis Street. We have made appropriate adjustments for foundation conditions and shape and circulation pattern.

We have compared the considerable quantity of glass enclosed commercial space with the glass canopies which we have constructed at the Quincy Market Building in Faneuil Hall Marketplace, making appropriate adjustments for size and dimension and the new State Energy Code and foundation conditions.

We have compared the Phase II low rise residential and commercial building with similar structures recently completed by us at Mission Park and on Blossom Street by the Mass. General Hospital, again making adjustments for the different distribution of bedrooms and bathrooms and for the foundation conditions.

The 3rd Phase Garage we have compared with precast garages which we have built at Mission Park and at the Cambridge Hyatt Regency Hotel recently and which are being studied by us as an alternate for the Affiliated Hospital Servicenter Garage on Francis Street, again making appropriate adjustments for shape, circulation and foundation conditions.

89 BRIGHTON AVENUE, BOSTON, MASSACHUSETTS 02134 (617) 254-1360

Not knowing the order of phasing or the timing of these projects, we have adjusted all of the figures to presume an April, 1979 construction start and have built the appropriate escalation for this. Any phases which may start in construction later should be escalated by between 8 and 10% per year for the construction cost after April, 1979.

For all of the commercial areas, we have assumed an unfinished shell (no floor finish, no ceilings, no partitions) with capacity only furnished for heating, air-conditioning and lighting.

In both cases, we have figured the pedestrian bridges to be glass enclosed.

Based upon all of these assumptions, we estimate the construction cost for the various components to be as follows:

Phase I High Rise Residences	$14,300,000.
Phase I Garage, Commercial, Recreation Deck and Bridge	7,900,000.
Phase II Residential and Commercial Building	4,000,000.
Phase III Garage and Bridge	3,150,000.
Total	$29,350,000.

We enclose a copy of a summary sheet indicating the scope of the areas and occupancy, as we interpret the schematic plans and as we have discussed them with you.

I am sending copies of this letter and enclosed sheet to Clare Cotton and Paul Hellmuth, since they had asked our help in producing rough parameters for these plans previously.

Obviously, there is much detail as yet not decided with such schematic plans. We would be happy to discuss our assumptions and take-offs with you in greater detail at any time and look forward to the possible opportunity of working with you in pre-construction, construction management, and cost consulting, and hopefully eventually in the construction of this very exciting project. Please do not hesitate to contact me or Norm Whiting regarding any questions which you may have.

Yours truly,

GEORGE B. H. MACOMBER COMPANY

George Macomber

George Macomber, President

GM:mk
Enc.

cc: Clare Cotton
Paul Hellmuth
Norman Whiting
Ken Leach

PRELIMINARY OUTLINE SPECIFICATIONS

FOR

HUNTINGTON PLACE

BOSTON, MASSACHUSETTS

FOR

THE BOSTON-FENWAY PROGRAM, INC.

HUGH STUBBINS AND ASSOCIATES, INC. ARCHITECTS AND PLANNERS
1033 Massachusetts Avenue Cambridge, Massachusetts 02138

June 27, 1978

PRELIMINARY OUTLINE SPECIFICATIONS

FOR

HUNTINGTON PLACE

A. SCOPE

This three-phase project is a mixed use development serving the interests of Wentworth Institute of Technology, Boston Museum of Fine Arts and Northeastern University, in the area bounded by Huntington Avenue, Ruggles Street and Tavern Road.

Phase I of the development, on land owned by Wentworth and Northeastern, comprises two high-rise towers, each housing 400 students; a parking garage for 710 vehicles; and commercial space, including food services and book store.

Phase II is a low-rise residence building for 144 students on land now privately owned.

Phase III is an additional parking garage between Parker Street and Tavern Road on lands now owned by Northeastern and the Commonwealth of Massachusetts.

Also included in the project is pedestrian access from the parking facility to the Museum of Fine Arts and the rapid transit station at Huntington Avenue; and grade level pedestrian connection through the site to Northeastern, Museum of Fine Arts and Ruggles Street transit station.

The buildings are sited to provide for the widening of Ruggles Street and the cross town transit easement as proposed.

B. GENERAL REQUIREMENTS

The financing of this project may include a variety of specialized funding agencies, such as HUD and HEFA.

The contract requirements of such agencies shall be included, along with standard AIA General Conditions.

All elements to conform to all applicable code requirements, including Architectural Barriers Board and Energy Conservation.

SECTION 2.1

SITE CLEARING AND EARTHWORK

A. DEMOLITION

1. Phase I - Existing 5-1/2 story brick student residence, Rubenstein Hall, to be demolished to grade and all debris removed from the site.

2. Phase II - Existing 4-1/2 story brick residential property and one-story wood structure, Punters' Pub, to be demolished to grade and all debris removed from the site.

B. EARTHWORK

1. Existing paved parking surface to be removed.

2. It is expected that ground water will be encountered approximately 10 feet below grade. Provide dewatering and recharging system to drain excavation and maintain water table on adjacent properties.

3. Provide sheeting, soring and bracing as required for excavation. Tower excavation to be done within sheet piling coffer dam.

4. Entire building area of residence toweres to be excavated to a depth of approximately 30 feet to provide for a mat foundation. All excavation to be carried sufficiently beyond exterior wall lines to permit installation of waterproofing on walls.

5. Parking facilities to be excavated to provide one full level below grade, founded on belled caissons to a depth of approximately 30 feet to provide bearing pressure of three tons.

6. All low-rise interior slabs on grade to have 24 inches of compacted clean, graded gravel fill.

7. All exterior paved areas to have minimum of 12 inches of compacted gravel fill.

SECTION 2.2

SITE IMPROVEMENTS

A. PAVING

1. Vehicular ways to be bituminous concrete paving with vertical granite curbs.
2. Pedestrian ways to be 6 inch reinforced 4000 psi concrete with patterned, tinted Bomanite topping.
3. Below grade parking levels to be bituminous concrete.

B. LANDSCAPING

1. Lawn areas to be seeded on 6 inch topsoil
2. Shade trees to be provided at street lines and at residence court
3. Courtyard benches to be fabricated of Douglas fir with steel supports.

SECTION 3.1

CAST IN PLACE CONCRETE

A. SCOPE

1. Foundation mat and walls for Residence Towers
2. Lightweight structural concrete fill for floors and roof of residence towers and low-rise.
3. Belled caisson foundation for low-rise structures
4. Walls, slabs and columns for parking structures.

B. MATERIALS

1. Tower foundation: Normal weight concrete, 3000 psi, with 60 ksi reinforcing steel.
    - a. Mat: 36 inches thick
    - b. Perimeter Walls: 16 inches thick
    - c. Cross walls at lowest level: 18 inches thick.
2. Tower and low-rise structure: Structural lightweight concrete fill, 3000 psi with welded wire fabric, 3-1/4 inc. thick.
3. Phase I Parking Structure Foundation: Normal weight concrete, 3000 psi.
    - a. Caissons: 23 feet long. Required: 50 - 6 ft. shaft and 10 ft. bell; 20 - 8 ft. shaft and 12 ft. bell.
    - b. Walls: 12 inches thick
4. Phase I Parking Structure Superstructure: Normal weight concrete, 4000 psi.
    - a. Columns: 16 in. x 24 in.

b. Roof and Floors: Post tensioned system

   (1) Beams: 12 in. x 36 in. (14 - 1/2 in. Ø 270 ksi strands)

   (2) Slabs: 6 in., with 1/2 in. Ø 270 ksi strands at 24 in.

   (3) Mild reinforcing: 60 ksi, 1.5 lb./cu. ft.

5. Phase III Parking Structure Foundation: Normal weight concrete, 3000 psi

   a. Caissons: 23 ft. long. Required: 35 - 6 ft. shaft with 10 ft. bell and 12 - 8 ft. shaft with 12 ft. bell.

6. Phase III Parking Structure Superstructure: Normal weight concrete, 4000 psi

   a. Columns

   b. Roof and Floors: Prestressed double-tees, 8 foot nominal width, 32 inches deep, 4 inch minimum stem width. 4 inch topping slab.

      (1) Tees set with one-inch joint filled with Isoflex,

   c. Edge Beams, Shear walls and ramps: Regular weight reinforced concrete.

SECTION 3.2

PRE-CAST CONCRETE

A. PARKING STRUCTURES

1. Spandrels to be precast concrete panels with sand finish all surfaces.

SECTION 4.1

MASONRY

A. MATERIALS

1. Masonry units for walls and partitions at parking structures to be hollow concrete blocks, 7-5/8" high, conforming to ASTM C90, Grade N-1 and U.L. Class D-2.

2. Masonry for non-rated walls in residence structures to be as above, ASTM C90, Grade N-1.

B. INSTALLATION

1. All masonry to be laid in running bond

2. All interior masonry paritions to be carried up to structure and sealed, and to have compressible filler.

3. All partitions to be reinforced with truss-type Dur-o-Wall or equal, every other course.

SECTION 5.1

MISCELLANEOUS METALS

A. STAIRS

1. Stairs to have stringers and supports fabricated of structural steel sections, ASTM A36, with A245 steel treads, risers and platforms.

2. Landings to support 150 lbs./sq. ft., treads 100 lbs. per sq. ft.

3. All stairs to be welded construction, shop fabricated and assembled insofar as possible.

B. RAILS

1. Stair rails: Welded steel pipe, 1-1/2" diameter

2. All rails designed to meet code requirements for strength.

C. LADDERS

1. Ladders at elevator pits and service areas to be welded construction, hot dip galvanized.

2. Ladders to support 300 lbs. per rung.

D. CLIP ANGLES

1. Angles for support of exterior wall panel system to be hot dip galvanized.

SECTION 5.2

STRUCTURAL STEEL AND DECK

A. STRUCTURAL STEEL

1. Residence Structures

    a. Moment resisting steel frame, 14.5 pounds per square foot.

    b. Composite floor beams with shear connectors.

B. STEEL DECK

1. Residence Structures

    a. Roof and floors: 2 inch, 18 gage, galvanized corrugated steel deck to receive reinforced topping.

SECTION 6.1

CARPENTRY AND MILLWORK

A. ROUGH CARPENTRY

1. All wood for blocking and nailers at roof to be construction grade Douglas fir or west coast hemlock, pressure treated in accordance with AWPA C2.

2. All grounds, strapping, blocking and nailers to be standard grade spruce. Wood embedded in concrete, plaster or mortar to have heavy coat of cuprinol.

B. DOORS

1. All room doors within residence suites to be 1-3/8" solid core, birch veneer faces, for transparent finish.

2. Other wood doors to be 1-3/4" solid core, birch veneer faces for transparent finish.

C. KITCHEN CABINETS

1. Modular base and wall cabinets with plastic laminate finish.

2. Countertops and backsplash to be plastic laminate bonded to 1-1/2" particle board.

D CLOSETS

1. Clothes closets to have metal hanging rod and one 10" wood shelf.

SECTION 7.1.

WATERPROOFING AND SEALANTS

A. SCOPE

1. Foundation walls below elevation +12.0 to have membrane waterproofing.

2. Foundation walls above elevation +12.0 to have mastic dampproofing.

3. Slabs on grade below elevation +7.0 to have metallic waterproofing, curbs.

4. Mechanical rooms above occupied spaces to have liquid applied traffic topping...

5. All concrete spandrels and shelves supporting exterior wall panels to have membrane flashing.

6. All joints between exterior wall panels and at openings in exterior walls to have sealant.

7. All interior joints at perimeter of openings in exterior walls to have calking.

B. MEMBRANE WATERPROOFING

1. 1/16 inch thick neoprene sheet, 42 inches wide, as manufactured by Gates Engineering or equal.

2. Applied to concrete surfaces with approved bonding agent, with all joints lapped minimum of 3 inches.

C. MASTIC DAMPPROOFING

1. Fiber reinforced bituminous compound for trowel application.

2. Applied in 1/16 inch thick trowel coat from 6 inches below grade to bottom of foundation walls or top of membrane waterproofing, as applicable.

D. METALLIC WATERPROOFING

1. Mixture of Portland cement, sand and water with finely pulverized powder of gray cast iron, treated to produce waterproofing qualities through oxidation of iron particles. Ironite or equal.

2. Applied to horizontal surfaces in one coat of one inch and to vertical surfaces in two coats to thickness of 5/8 inch. Provide 12 inch high base at all exterior walls and penetrations through slab.

E. MEMBRANE FLASHING

1. Non-reinforced, homogeneous, impermeable elastomeric sheeting, 1/16 inch thick. Contour Flash by Gates Engineering or equal.

F. TRAFFIC TOPPING

1. Polyurethane system with granules added for traction. Pedestrian Traffic Topping by 3M or equal.

2. Applied to floor and turned up to form 4 inch integral base.

G. SEALANT

1. Two-part polysulfide base compound, non-staining and non-sagging.

H. CALKING

1. One-part acrylic-latex calking compound.

SECTION 7.2

ROOFING AND FLASHING

A. RESIDENCE STRUCTURES

1. Insulated membrane system, with full 10 year warranty.
    a. Membrane: Three-ply asphalt impregnated organic felt.
    b. Insulation: Styrofoam RM insulation of thickness required to obtain total U factor of 0.07.
    c. Aggregate: 3/4 inch crushed stone at rate required for design insulation thickness.
    d. Base Flashing: Built-up type over fiber cant
    e. Gravel Stop and Fascia: Preformed, prefinished aluminum.

B. PARKING STRUCTURES

1. Uninsulated traffic deck.
    a. Phase I: Waterproof recreation deck system by 3M or equal.
    b. Phase III: Vehicular Traffic Topping by 3M or equal.

SECTION 7.3

PREFORMED SIDING

A. MATERIALS - RESIDENCE STRUCTURES

1. Prefabricated panel system as manufactured by Cement Enamel Development, or equal.

2. Panel framing to be 4 inch deep 16 gage steel studs, 16 inches on center, fully welded construction.

3. Exterior skin to be 1/4 inch thick cement asbestos board, secured to studs with non-corrosive screws, plus adhesive. All edges sealed.

4. Exterior finish to be decorative exposed aggregate in matrix of portland cement, sand and mineral oxide colors, with emulsion binders.

5. Insulation to be full thick fiberglass batts.

B. INSTALLATION

1. Panels to be secured to clip angles furnished and installed by Miscelleanous Metals.

2. All joints to be flashed and sealed by Sealant subcontractor.

SECTION 7.4

SPRAY FIREPROOFING

A. RESIDENCE STRUCTURES

1. All steel columns and beams to have cementitious spray fireproofing of thickness and density to provide 3-hour protection for columns and 2-hour protection for beams.

SECTION 8.1

METAL WINDOWS, GLASS AND GLAZING

A. WINDOWS

1. Residence Units: Extruded aluminum fixed and awning units with 2 inch deep sections, dark duranodic finish.

   Glazing: 5/8 inch insulating units, clear glass.

2. Commercial areas: Tubular aluminum framed vertical and sloped walls with condensate gutters, dark duranodic finish.

   Glazing: One-inch insulating units, fully tempered bronze tinted glass.

B. ENTRANCE DOORS

1. Medium stile dark duranodic aluminum with fully tempered 1/4 inch bronze tinted glass.

SECTION 8.2

HOLLOW METAL WORK

A. FRAMES

1. All frames to be fully welded construction
2. Interior frames to be 16 gage
3. Exterior frames to be 14 gage, hot dip galvanized.

B. DOORS

1. Interior doors, except fully glazed to be 18 gauge with continuous vertical mechanical interlocking joints at lock and hinge edges, with edge seams welded and ground smooth.
2. Fully glazed doors to be 16 gage, with continuously welded stiles and rails, wide stile design,
3. Exterior doors to be 16 gage, galvanized, with flush top and bottom caps.

C. DOORS AND FRAMES

1. All doors and frames in fire rated walls and partitions to bear UL label
2. All doors and frames to have shop applied baked primer.

SECTION 8.3

FINISH HARDWARE

A. HARDWARE TYPES

Butts or pivots:	1-1/2 pairs per door, regular weight, 4-1/2" x 4-1/2", full ball bearing. Doors 3'-6" wide and over to have extra heavy weight.
Locksets:	Mortise, brushed chrome finish
Closers:	Surface mounted
Stops:	Floor type
Exit devices:	Concealed
Thresholds:	Aluminum

B. SCHEDULE OF HARDWARE SETS

HW SET #1

Pairs Exterior Doors - Egress from Residence Lobbies

Pivot reinforced hinges
Exit devices
Closers
OH Holders
Astragal
Threshold

HW SET #2

Entrance Doors - Commercial and Parking

Pivot reinforced hinges
Dead locking latchset
Closer
Threshold
Weatherstrip

HW SET #3

Single Exterior Doors - Egress

Pivot reinforced hinges
Exit device - less outside trim
Closer
Threshold
Weatherstrip

HW SET #4

Single Interior Doors to Stairs

Hinges
Latch set
Closer
Kick Plate
Stop

HW SET #5

Pairs Interior Doors

Hinges
Flush bolts
Lockset
Closers
Kickplates
Stops

HW SET #6

Single Doors at Storage and Service

Hinges
Lockset
Closer
Kickplate
Stop

HW SET #7

Single Doors at Public Toilets

Hinges
Mortise deadlock
Push plate
Pull
Closer
Kickplate
Stop

HW SET #8

Single Doors at Offices, Mail, Recreation

Hinges
Lockset
Stop

HW SET #9

Single Doors at Suite Entrances

Hinges
Lockset
Closer
Knocker/Viewer
Stop

HW SET #10

Single Doors - Bedrooms and Baths

Hinges
Lockset
Stop

HW SET #11

Single Doors - Closets

Hinges
Latchset
Stop

HW SET #12

Bi-fold Doors - Clsets

Track set
Pulls

3. BATHROOM AND TOILET ACCESSORIES

1. Each bathroom to have:

2	Medicine cabinets with mirror
1	Soap and grab at tub or shower
2	Toothbrush and tumbler holders
1	Toilet paper holder
	Towel bars
2	Robe hooks

2. Public toilet rooms to have:

Mirror over lavatories
Soap dispenser at each lavatory
Paper towel dispenser/waste receptacle
Toilet paper holders

SECTION 9.1

DRYWALL CONSTRUCTION

A. STUDS AND FURRING

1. Steel studs: 25 gage screw type with knockouts

   a. Within residence suites: 2-1/2 inch

   b. Corridor partitions and public areas: 3-5/8 inch

   c. Shaft walls: 2-1/2 inch T-studs

2. Furring at masonry walls: 7/8 inch hat channels

B GYPSUM BOARD

1. Wall board generally to be regular gypsum wallboard 1/2 inch thick, tapered long edges.

2. Wallboard for fire rated partitions to be 1/2 inch fire code.

3. Wallboard for use in toilets to be moisture resistant

4. Wallboard for use on exterior walls to be foil faced

5. Shaftwalls to have one-inch shaftwall liner,and two layers of 5/8 inch firecode gypsum wallboard. System designed for construction of through floor shafts from one side.

C. MISCELLANEOUS

1. Adhesive beads, joint tapes, joint compound and concealed calking to be as recommended by board manufacturer. Exposed calking to be one-part acrylic_ latex.

2. Fire rated corridor paritions to have mineral wool, full thickness blanket; Thermafiber or equal.

D. INSTALLATION

1. All partitions to extend to structure above and to have 3/8 inch diameter calking beads on both sides of floor and ceiling runners and end studs before wallboard is applied.

2. Studs to be 16 inches on center.

3. Partitions generally to have one layer of 1/2 inch gypsum board each side. Partitions at corridors to have two layers of 1/2 inch firecode gypsum board on corridor side and one layer of 1/2 inch firecode on room side, with joints staggered.

4. Edges of drywall partitions abutting other materials to have casing beads and calking.

SECTION 9.2

CEILINGS

A. GENERAL

1. All suspension systems to conform to ASTM C635, Intermediate Duty System, and all components to be sized to support ceiling loads without exceeding maximum deflection of 1/360th of span.

B. MATERIALS

1. Drywall: 5/8 inch gypsum drywall on concealed suspended furring system in all residence units.

2. Acoustic Tile: Concealed spline system with 12" x 12" mineral tiles for all corridors and public areas of residence buildings.

C. INSTALLATION

1. All suspension systems to be secured to structure.

2. Provide separate supports from structure for lighting fixtures and heating grilles.

SECTION 9.3

FLOORING

A. RESILIENT FLOORING

1. Resilient tile generally: 1/8 inch thick, 12" x 12" vinyl asbestos, 'Thru-Chip' pattern, Excelon series by Armstrong or equal.
2. Resilient tile for Lobbies of Residence buildings: Standard gauge 12" x 12" sculptured reinforced vinyl, Flex-Slate by Flintkote or equal.
3. Resilient base: 4" high vinyl, coved at resilient floors, straight at carpeted areas.
4. Vinyl stair treads: 1/8" ribbed, with integral nosing.

B. CARPET

1. Carpet to comply with applicable codes and Federal Bulletin UM 44-C, Type I, Class 2.

Pattern:	Stati-Tuft
Manufacturer:	Bigelow/Sanford
Pile Yarn:	4-ply Antron III with static control
Construction:	Level loop tufted
Rows:	8.4/inch
Gauge:	1/8
Pile Height:	3/16"
Face Weight:	28.32 oz./sq. yd.

SECTION 9.4

CERAMIC TILE

A. MATERIALS

1. All tile to be of domestic manufacture, standard grade. All patterns to be face mounted.

2. Floor tile: 1" x 1" x 1/4" ceramic mosaic tile.

3. Wall tile: 4-1/4" x 4-1/4" x 5/16" non-vitreous semi-matte glazed, cushion edge.

4. Base: 4-1/4" x 4-1/4" coved units at tile floors.

5. Setting Bed: Organic adhesive as recommended by National Tile Institute.

B. INSTALLATION

1. All tile shall be installed in accordance with appropriate ANSI standards.

2. All tile to be grouted with Portland cement grout.

SECTION 9.5

FINISH PAINTING

A. SCOPE

1. Finishing of all wood, drywall, metal, masonry and concrete surfaces as indicated in Finish Schedule.
2. Painting of all exposed mechanical equipment and piping not factory finished.

B. SCHEDULE

1. Exterior metal: Shop coated or galvanized - Two coats metal finish enamel
2. Exterior cast-in-place concrete: One coat exterior breathing latex
3. Interior metal: Two coats metal finish enamel
4. Gypsum board ceilings: Two coats flat latex
5. Gypsum board walls: Two coats alkyd semi-gloss
6. Masonry block and concrete walls: One coat primer/filler and one coat alkyd semi-gloss
7. Concrete ceilings: One coat texture finish
8. Wood doors and trim: Stain and two coats varnish

SECTION 9.6

VINYL WALL COVERING

A. MATERIAL

1. Pigmented, mildew inhibitorized polyvinyl chloride, fused to pre-shrunk, mildew resistant cotton fabric, conforming to Federal Spec. CCC-W-408, Class 2.

2. Minimum weight: 13.5 oz./sq. yd.

3. Pattern: Lino by L. E. Carpenter or equal.

SECTION 10.1

TOILET PARTITIONS

A. TOILET COMPARTMENTS

1. Floor mounted, head rail braced, anti-grip rails.
2. Doors and partitions: 1" thick with sound deadening core. Doors: 22 gage; partitions: 20 gage.
3. Pilasters: 1-1/4" thick, 18 gage, with stainless steel plinth.
4. Finish: Baked enamel
5. Hardware: Standard door hardware, combination hook and bumper.

B. URINAL SCREENS

1. Wall mounted, 1" thick panel.

SECTION 13.1

PEDESTRIAN BRIDGE

A. DESCRIPTION

1. Steel tube structure with vaulted roof and south wall of molded fiberglass panels.

2. North wall to have fixed glazing of Lexan

3. Soffit of bridge to be enameled steel panels.

SECTION 14.1

ELEVATORS

A. GENERAL

1. Electric geared traction elevators as manufactured by Westinghouse or equal. Parking facility elevators may be oil-draulic.
2. Elevators to be suitable for passenger and service use and shall meet requirements of Massachusetts Elevator Code.

B. DESCRIPTION

		Phase I		Phase II	Phase III
1.	Quantity:	6	2	2	2
2.	Number of Landings:	20	7	6	7
3.	Capacity:	2500 lbs.			
4.	Speed:	300 ft./min.			
5.	Operation:	Zoned Automatic & Selective collective			
6.	Platform size:	7'0" x 5'-0"			
7.	Cab:	Westinghouse Design 1135			
8.	Car Doors:	Plastic laminate with stainless steel binders			
9.	Hoistway Doors:	EN 40 Design - Baked enamel finish			
10.	Door Operation:	Center opening			
11.	Signals:	Car position indicator, Car direction indicator in jamb, car and corridor call register lights, car position indicator at lobby			

C. FEATURES

1. Each car to have load-weighing device to permit a fully loaded car to by-pass corridor calls without cancelling them.

2. System to be installed to permit one car at a time in each bank to operated on Emergency Power.
3. System to include Fireman's Switch
4. Control panels to conform to Rules and Regulations of Architectural Barriers Board.

PLUMBING AND FIRE PROTECTION

DRAINAGE

The roof level shall be a gravity drainage system discharging directly to the storm drainage system located in the adjacent streets.

The intermediate levels shall be a gravity drainage system discharging through a gasoline and sand trap and connecting directly to the sanitary drainage system located in the adjacent streets.

Commercial spaces shall be provided with a modular system of capped sanitary waste and vent piping which will be completed by the individual tenants as space is developed. This system shall discharge by gravity to the sanitary drainage system located in the adjacent streets.

DOMESTIC WATER

The domestic water system shall enter the building from the available water mains located in the adjacent streets. The water system shall be distributed throughout the facility with connections to employee toilet rooms, and capped connections on a modular system to the commercial spaces which will be completed by the individual tenants as space is developed.

HOT WATER

Hot water will be generated by electric storage heaters at employees toilet rooms. Hot water for tenant areas shall be installed by the tenant as space is developed. Employees heaters shall be 20 gallon storage with 9 KW recovery.

FIRE PROTECTION

The fire protection systems shall be served by the water mains located in the adjacent streets. A sprinkler system shall be provided in the basement and on all floors above the sixth level of parking. Each level will be provided with a standpipe system with risers in each of the three stair wells. The standpipe system shall include a fire pump, jockey pump and control cabinets. The fire pump shall be rated for 1000 GPM at 55 PSI.

PLUMBING AND FIRE PROTECTION

DRAINAGE

The roof levels shall be a gravity storm drainage system discharging directly to the storm drainage system located in the adjacent streets.

The sanitary drainage system from all toilet and kitchen facilities above the ground floor level shall be a gravity drainage system discharging directly to the sanitary drainage system located in the adjacent streets. All sanitary drainage from basement levels shall be pumped and connected to the gravity system as it leaves the building.

DOMESTIC WATER

The domestic water system shall enter the building from available water mains located in the adjacent streets. The water system shall be distributed throughout the entire building with the aid of a duplex booster pump system. Each pump rated for 180 GPM at 125' TDH.

HOT WATER

Hot water will be generated by two steam fired storage heaters located in the basement. The hot water system both supply and return shall be distributed throughout the entire building connecting to all toilets and kitchens. Each heater shall have 1000 gallon storage and shall recover 600 GPH.

FIRE PROTECTION

The fire protection systems shall be supplied by the water mains located in the adjacent streets. The building shall be totally sprinklered and also provided with a standpipe system. The standpipe system shall include a fire pump, jockey pump and control cabinets. The fire pump shall be rated for 500 GPM at 110 PSI.

PLUMBING AND FIRE PROTECTION

The Plumbing and Fire Protection services for Phase IB shall be the same as described for Phase IA.

PLUMBING AND FIRE PROTECTION

DRAINAGE

The roof levels shall be a gravity storm drainage system discharging directly to the storm drainage system located in the adjacent streets.

The sanitary drainage system from all toilet and kitchen facilities above the ground floor level shall be a gravity drainage system discharging directly to the sanitary drainage system located in the adjacent streets. All sanitary drainage from basement levels shall be pumped and connected to the gravity system as it leaves the building.

Commercial spaces shall be provided with a modular system of capped sanitary waste and vent piping which will be completed by the individual tenants as space is developed. This system shall discharge by gravity to the sanitary drainage system located in the adjacent streets.

DOMESTIC WATER

The domestic water system shall enter the building from the available water mains located in the adjacent streets. The water system shall be distributed throughout the facility with connections to kitchens and toilet rooms, and capped connections on a modular system to the commercial spaces which will be completed by the individual tenants as space is developed.

HOT WATER

Hot water will be generated by a steam fired storage heater located in the basement. The hot water system both supply and return shall be distributed throughout the entire building connecting to all toilets and kitchens. The heater shall have a storage of 500 gallons and a recovery of 350 GPH. Hot water for commercial spaces shall be generated by electric hot water heaters installed by the tenants as space is developed.

FIRE PROTECTION

The fire protection system shall be supplied by the water mains located in the adjacent streets. The building shall have a sprinkler system in the basement only.

PLUMBING AND FIRE PROTECTION

DRAINAGE

The roof level shall be a gravity drainage system discharging directly to the storm drainage system located in the adjacent streets.

The intermediate levels shall be a gravity drainage system discharging through a gasoline and sand trap and connecting directly to the sanitary drainage system located in the adjacent streets.

DOMESTIC WATER

The domestic water system shall enter the building from the available water mains located in the adjacent streets. The water system shall be distributed throughout the facility with connections to employees toilet rooms.

HOT WATER

Hot water will be generated by electric storage heaters at employees toilet rooms.

FIRE PROTECTION

The fire protection systems shall be served by the water mains located in the adjacent streets. A sprinkler system shall be provided in the basement and on all floors above the sixth level of parking. Each level will be provided with a standpipe system with risers in each of the four stair wells. The standpipe system shall include a fire pump, jockey pump and control cabinets. The fire pump shall be rated for 1500 GPM at 60 PSI.

HEATING, VENTILATING AND AIR CONDITIONING

GENERAL

A complete and operable ventilation system shall be provided for the lower garage level. The commercial areas shall have provisions for connections to hot water heating and chilled water cooling systems. If Phase I is accomplished prior to Phase IA construction, complete and operable heating and cooling equipment shall be within this building. If Phase IA construction is accomplished in conjunction with Phase I, heating and cooling services shall be provided through underground piping from a central plant located in one of the tower buildings.

VENTILATION

The lower garage level shall be ventilated by means of natural supply and mechanical exhaust. Air shall be supplied through intakes located along the perimeter walls. Exhaust air shall be ducted from the interior to mechanical exhaust fans located on the roof. The system shall be capable of providing six complete air changes each hour.

HEATING

Hot water supply and return piping mains shall be provided with valved connections at each commercial area to suit installation of perimeter radiation and air handling units by the tenants. Hot water shall be pumped through steam convertors, with the supply temperature automatically compensated in proportion with outdoor temperature.

Low pressure steam shall be provided to the domestic hot water heater (furnished under the Plumbing Section) and to the hot water convertor. Condensate shall be mechanically returned to the heating boiler.

A light oil fired, low pressure steam boiler shall be installed in a lower level boiler room only if Phase I is accomplished prior to Phase IA construction. The boiler shall be the cast iron sectional type with an estimated capacity of 1,200,000 B.T.U. per hour. An underground storage tank with an estimated capacity of 3,500 gallons shall be installed adjacent to the building.

Underground steam supply and condensate teturn piping shall be provided to the building under Phase IA. All piping systems installed under Phase I shall be suitable for connection to this piping, and extension in the future for Phase II construction.

COOLING

Chilled water supply and return piping shall be provided with valved connections at each commercial area to suit installation of air conditioning systems by the tenants.

An air cooled water chiller and pump shall be installed at the roof level only if Phase I is accomplished prior to Phase IA construction. The equipment shall have an estimated cooling capacity of 100 tons.

Underground chilled water supply and return piping shall be provided to the building under Phase IA. All piping installed under Phase I shall be suitable for connection to this piping, and extension in the future for Phase II construction.

INSULATION

All steam, condensate, hot water and chilled water piping and fittings shall be thermally insulated. Insulation shall be fiberglass with an all service, flame resistant jacket. Insulation thickness shall be in accordance with the State Building Code. Underground piping shall be enclosed in conduit.

CONTROLS

The heating and cooling equipment furnished under Phase I shall be provided with complete controls to maintain required temperatures and automatic operation.

HEATING, VENTILATING AND AIR CONDITIONING

GENERAL

A complete and operable system of heating, ventilating and air conditioning shall be provided for the Dormitory Tower, providing positive temperature control in all areas. Primary heating and cooling equipment shall provide services for this building and the Parking Garage/Commercial Building under Phase I, and shall be suitable for the installation of additional equipment for service to Phases IB and II.

CENTRAL HEATING

The building heating plant shall consist of two heavy-oil fired, low pressure steam boilers of the packaged fire tube type. The estimated capacity of each boiler is 200 Boiler Horsepower. Two underground storage tanks, each with an estimated capacity of 30,000 gallons, shall be installed adjacent to the building. Boiler operation and modulation shall be completely automatic with lead-lag control. The installation shall be suitable for the installation of a third boiler for Phases IB and II. A factory built insulated stack sized for the three boilers shall be extended through the building to discharge above the roof.

Steam shall be supplied to a hot water convertor, the underground piping described under Phase I, and to the building domestic hot water heater (furnished under the Plumbing Section), with provisions for connection to underground piping for Phase IB. Condensate shall be returned to a boiler feed receiver and pumping unit.

Hot water shall be pumped through the convertor and distributed through supply and return piping to terminal units throughout the building. The temperature of the hot water shall be automatically compensated in proportion with outdoor temperature.

CENTRAL COOLING

The building cooling plant shall consist of two centrifugal chillers, each with an estimated capacity of 250 tons. Heat rejection shall be by means of sectional type, centrifugal cooling towers. The chilled water plant shall operate automatically. The installation shall be suitable for the installation of a third chiller and additional cooling tower sections for Phases IB and II.

Chilled water shall be pumped through supply and return piping to terminal units throughout the building.

SPACE HEATING AND COOLING

Vertical fan coil units shall be installed along the exterior wall to provide heating and cooling services to each room above the ground floor. The units shall be provided with factory installed hot water supply and return, chilled water supply and return, and drain piping risers for vertical stacking. Controls shall be provided to automatically maintain desired heating and cooling services.

A central air conditioning unit and perimeter hot water radiation shall be provided for service to the ground floor.

Entrances, stairwells and service areas shall be heated by individual heating units.

VENTILATION

All toilets shall be mechanically exhausted through vertical duct risers to mechanical exhaust fans located at the roof.

Vertical duct risers shall be provided at each kitchen area to suit the installation of individual range hood exhaust units.

All service areas shall be mechanically exhausted. Provisions shall be made to exhaust laundry clothes driers through the exterior wall.

An emergency smoke ventilation system shall be provided for the stairwells and stair entrances in accordance with the State Building Code.

INSULATION

All steam, condensate, hot water and chilled water piping and fittings shall be thermally insulated. Insulation shall be fiberglass with an all service, flame resistant jacket. Insulation thickness shall be in accordance with the State Building Code. Underground piping shall be enclosed in conduit.

HEATING, VENTILATING AND AIR CONDITIONING

GENERAL

The services for Phase IB shall be the same as those described for Phase IA, except that the heating boilers, chillers and cooling towers shall be installed remotely in the Phase IA building.

HEATING

A third 200 Boiler Horsepower boiler shall be installed adjacent to and to operate in conjunction with the Phase IA boilers. Steam supply and condensate return shall be connected to this building by means of underground piping.

The heating convertor, hot water distribution and domestic hot water supply shall be identical to those described for Phase IA.

COOLING

A third 250 ton chiller and associated cooling tower sections shall be installed and operate in conjunction with the Phase IA chilled water plant. Chilled water supply and return shall be connected to this building by means of underground piping.

OTHER SERVICES

All other services shall be identical to those described for Phase IA.

HEATING, VENTILATING AND AIR CONDITIONING

GENERAL

Steam and chilled water services shall be an extension of the Phase IB services through the Phase I construction.

HEATING

The heating convertor and domestic hot water supply shall be the same as described for Phase I. Hot water distribution shall be the same as described for Phase I for the Commercial area, and the same as described for Phase IA for the Dormitory area.

COOLING

Chilled water distribution shall be the same as described for Phase I for the Commercial area, and the same as described for IA for the Dormitory area.

SPACE HEATING AND COOLING

Services for the Dormitory area shall be the same as those described for Phase IA.

Provisions for tenant installed services in the Commercial area shall be the same as those described for Phase I.

VENTILATION

Ventilation services for the Dormitory area shall be the same as those described for Phase IA.

INSULATION

Insulation requirements shall be the same as those described in Phase I.

HEATING, VENTILATING AND AIR CONDITIONING

GENERAL

Services for Phase III shall be limited to the ventilation of the lower Garage level. Requirements shall be the same as those required for the lower Garage level of Phase I.

ELECTRICAL

ELECTRICAL SERVICE

Electrical service to the parking garage to be 13.8KV underground from the Boston Edison Company system on Huntington Avenue to a basement transformer vault. Metering will be at the primary voltage. The service to accomodate the entire project exclusive of commercial spaces. Transformation from the service voltage to the utilization voltage 120/208 Volt, 3 Phase, 4 Wire estimated 300 KVA.

Electrical service to the commercial space shall be a separate 13.8 KV underground service. Transformers to be provided by the utility company. Utilization voltage to each commercial space shall be at 120/208 Volt, 3 Phase, 4 Wire from a distribution switchboard. This switchboard shall contain a main service breaker and metering equipment for each space.

EMERGENCY ELECTRICAL SYSTEM

The emergency generation system to consist of a diesel engine driven alternator, automatic transfer switches, fuel oil tank and piping and exhaust system. This generator will serve all phases of construction. Estimated 750 KW, 120/208 Volt, 3 Phase, 4 Wire.

The emergency distribution system to consist of distribution panel with feeder breakers for each construction phase. The parking garage emergency system to consist of an automatic transfer switch and accessory equipment to provide energy for stair lighting, certain vestibule and lobby lights, one elevator and fire pump.

Commercial spaces to be provided with emergency lighting battery units within each space.

ELECTRICAL DISTRIBUTION SYSTEMS

Normal and emergency distribution systems to consist of distribution panelboard, lighting panelboards, motor control centers, transformers, raceways, cables, wiring, junction and pull boxes, terminal cabinets, wireways and all other components required for a complete distribution system.

Garage panelboards to be weatherproof, lockable and located on each floor.

A panelboard to be located in each commercial space to serve the lighting, small power, and HVAC equipment in that space.

LIGHTING SYSTEM

Garage lighting to be high pressure sodium, weatherproof fixtures ceiling mounted with guards to provide 10 footcandles along the driving lanes and 5 footcandles along the parking lanes. The total lighting load shall not exceed .25 watts per square foot.

The garage roof tennis courts to be provided with HID lighting fixtures mounted on 30 foot poles to provide 10 footcandles of illuminiation on the court.

The commercial spaces to be provided with recessed fluorescent lighting fixtures for general lighting.

POWER SYSTEM

Disconnect switches to be furnished, installed and connected. Motor controllers, starters and combination starter/switches will be furnished and installed by the respective sub-contractor as part of the complete system.

Power wiring for equipment furnished by others to be included under this division. All control system wiring and components will be by their respective contractors.

OUTLETS

Maintenance outlets to be provided in lobbies and parking areas.

Commercial spaces to have convenience outlets on 12 foot centers around the perimeter of each space.

TELEPHONE SYSTEM

Telephone outlets to be provided to office areas with conduits and sleeves to the telephone service area.

Each commercial space to be provided with a telephone service conduit to the telephone service equipment.

The telephone service will be underground from the N.E.T. Company manhole. 4" conduit.

FIRE ALARM SYSTEM

Provide an electrically operated, zoned, class "A", double supervised, closed circuit fire alarm system with battery stand-by. Equipment shall consist of a control unit, manual stations, alarm signals, heat and smoke detectors, fan shutdown, sprinkler connections, elevator selective operation, telephone speaker system, master box and connection to the City system.

ELECTRICAL

ELECTRICAL SERVICE

Electrical service to be underground from the Phase I service area at 13.8 KV.

Provide an estimated 1500 KVA dry type transformer in basement transformer vault, for a 120/208 Volt, 3 Phase, 4 Wire distribution system.

Furnish and install a 13.8 KV service disconnect switch in the basement electric room.

EMERGENCY ELECTRICAL SYSTEM

Emergency electrical service to be approximately 600 AMP, underground from the emergency generator at the Phase I location.

The emergency system to consist of the service, automatic transfer switch, distribution panelboard and accessory equipment to provide energy for stair and corridor lighting, certain vestibule and lobby lighting, one elevator, fire pump and certain heating and plumbing pumps.

ELECTRICAL DISTRIBUTION SYSTEMS

Normal and emergency distribution systems shall consist of distribution switchboards and panels, lighting panelboards, motor control centers, transformers, raceways, cables, wiring, junction and pull boxes, terminal cabinets, wireways and all other components for a complete distribution system.

Normal panelboards shall be located in an electrical closet on each floor to serve the lighting and power requirements for that floor.

Emergency lighting panelboards shall be located on every third floor to serve that floor and the floor above and below.

LIGHTING SYSTEM

Each bedroom unit to have the following:

a. Wall or ceiling mounted fixtures in the foyer, kitchen, bathroom, hall, and storage room.

b. Undercabinet fluorescent strip in the kitchen.

c. Living rooms and bedrooms to have duplex outlets, two circuit, switched at the door.

d. Three-way switching in all walk-through rooms and halls.

LIGHTING SYSTEM (Continued)

Corridors and lobbies to have recessed fluorescent fixtures.

Exterior lighting to be pole mounted walk-way type for security.

POWER SYSTEM

Disconnect switches to be furnished, installed and connected. Motor controllers, starters and combination starter/switches to be furnished and installed by the respective sub-contractor as part of the complete system.

Power wiring for equipment furnished by others to be included under this division. All control system wiring and components will be by their respective contractors.

OUTLETS

Corridors and lobbies to have maintenance outlets.

Each bedroom unit shall have duplex receptacles on all walls on 12 foot centers, and on walls with 6 feet of usable space.

Kitchen areas to have small appliance outlets at each counter space.

Outlets for dishwashers, disposals and kitchen units will be provided in each kitchen.

TELEPHONE SYSTEM

Telephone outlets to be provided in each living room with conduit and conduit sleeves to a terminal cabinet on each floor.

Conduit sleeves to be provided vertically through the building to the basement telephone service room.

Telephone service to be 4" conduit to the N.E.T. Company manhole.

FIRE ALARM SYSTEM

An electrically operated, boned, class "A", double supervised, closed circuit fire alarm system with battery stand-by will be provided.

Equipment to consist of a control unit, manual stations, alarm signals, heat and smoke detectors, fan shutdown, sprinkler connections, elevator selective operation, telephone speaker system, and connection to the City system.

MASTER ANTENNA TELEVISION SYSTEM

A master antenna television system to be provided to receive all commercial television station signals and distribute the signals to outlets in each living room, lounge and recreation room.

Antenna will be roof mounted.

Outlets to permit simple connection of standard television receivers.

The system to provide a minimum signal level of 2 millivolts across 75 ohms impedence for each outlet.

APARTMENT COMMUNICATION SYSTEM

A wired communication system from the lobby to each bedroom unit will be provided with lobby door release feature.

The system will consist of a master station located in the lobby, remote stations located in each bedroom unit vestibule to provide two-way communication between the station and lobby, buzzer in each station and an entrance signal push button at the building entrance.

The master station will contain a 24 volt D.C. power supply for the entire system. All system components will be solid state modules of the plug-in type.

ELECTRICAL

The electrical systems for Phase IB shall be as described for Phase IA.

ELECTRICAL

ELECTRICAL SERVICE

Electrical service to be underground from the Phase I service area at 13.8 KV.

Provide an estimated 500 KVA dry type transformer in basement transformer vault for a 120/208 Volt, 3 Phase, 4 Wire distribution system.

Furnish and install a 13.8 KV service disconnect switch in the basement electric room.

Electrical services to the commercial space shall be from the commercial service outlined in Phase I. Transformers to be provided by the utility company. Utilization voltage to each commercial space shall be at 120/208 Volt, 3 Phase, 4 Wire from a distribution switchboard. This switchboard shall contain a main service breaker and metering equipment for each space.

EMERGENCY ELECTRICAL SYSTEM

Emergency electrical service to be approximately 400 amp, underground from the emergency generator at the Phase I location.

The emergency system to consist of the service, automatic transfer switch, distribution panelboard and accessory equipment to provide energy for stair and corridor lighting, certain vestibule and lobby lighting, one elevator, fire pump, and certain heating and plumbing pumps.

Commercial spaces to be provided with emergency lighting battery units within each space.

ELECTRICAL DISTRIBUTION SYSTEMS

Normal and emergency distribution systems shall consist of distribution switchboards and panels, lighting panelboards, motor control centers, transformers, raceways, cables, wiring, junction and pull boxes, terminal cabinets, wireways and all other components for a complete distribution system.

A panelboard to be located in each commercial space to serve the lighting, small power, and HVAC equipment in that space.

LIGHTING SYSTEM

Each bedroom unit to have the following:

a. Wall or ceiling mounted fixtures in the foyer, kitchen, bathroom, hall, and storage room.

b. Undercabinet fluorescent strip in the kitchen.

c. Living rooms and bedrooms to have duplex outlets, two circuit, switched at the door.

d. Three-way switching in all walk-thru rooms and halls.

Corridors and lobbies to have recessed fluorescent fixtures.

Exterior lighting to be pole mounted walk-way type for security.

The commercial spaces to be provided with recessed fluorescent lighting fixtures for general lighting.

POWER SYSTEM

Disconnect switches to be furnished, installed and connected. Motor controllers, starters and combination starter/switches will be furnished and installed by the respective sub-contractor as part of the complete system.

Power wiring for equipment furnished by others to be included under this division. All control system wiring and components will be by their respective contractors.

OUTLETS

Corridors and lobbies to have maintenance outlets.

Each bedroom unit shall have duplex receptacles on all walls on 12 foot centers, and on walls with 6 feet of usable space.

Kitchen areas to have small appliance outlets at each counter space.

Outlets for dishwashers, disposals and kitchen units will be provided in each kitchen.

Commercial spaces to have convenience outlets on 12 foot centers around the perimeter of each space.

TELEPHONE SYSTEM

Telephone outlets to be provided in each living room with conduit and conduit sleeves to a terminal cabinet on each floor.

Conduit sleeves to be provided vertically through the building to the basement telephone service room.

Telephone service to be 4" conduit to the N.E.T. Company manhole.

Each commercial space to be provided with a telephone service conduit to the telephone service equipment.

FIRE ALARM SYSTEM

An electrically operated, zoned, class "A", double supervised, closed circuit fire alarm system with battery stand-by will be provided.

Equipment to consist of a control unit, manual stations, alarm signals, heat and smoke detectors, fan shutdown, sprinkler connections, elevator selective operation, telephone speaker system, and connection to the city system.

MASTER ANTENNA TELEVISION SYSTEM

A master antenna television system to be provided to receive all commercial television station signals and distribute the signals to outlets in each living room, lounge and recreation room.

Antenna will be roof mounted.

Outlets to permit simple connection of standard television receivers.

The system to provide a minimum signal level of 2 millivolts across 75 ohms impedence for each outlet.

APARTMENT COMMUNICATION SYSTEM

A wired communication system from the lobby to each bedroom unit will be provided with lobby door release feature.

The system will consist of a master station located in the lobby, remote stations located in each bedroom unit vestibule, to provide two-way communication between the station and lobby, buzzer in each station and an entrance signal push button at the building entrance.

The master station will contain a 24 volt D.C. power supply for the entire system. All system components will be solid state modules fo the plug-in type.

ELECTRICAL

ELECTRICAL SERVICE

Electrical service to be underground from the Phase I service area at 13.8 KV.

Provide an estimated 225 KVA dry type transformer in basement transformer vault, for a 120/208 Volt, 3 Phase, 4 Wire distribution system.

Furnish and install a 13.8 KV service disconnect switch in the basement electric room.

EMERGENCY ELECTRICAL SYSTEM

Emergency electrical service to be approximately 300 amp, underground from the emergency generator at the Phase I location.

The emergency system to consist of the service, automatic transfer switch, distribution panelboard and accessory equipment to provide energy for stair and corridor lighting, certain vestibule and lobby lighting, one elevator, fire pump, and certain heating and plumbing pumps.

ELECTRICAL DISTRIBUTION SYSTEMS

Normal and emergency distribution systems shall consist of distribution switchboards and panels, lighting panelboards, motor control centers, transformers, raceways, cables, wiring, junction and pull boxes, terminal cabinets, wireways and all other components for a complete distribution system.

Garage panelboards to be weatherproof, lockable and located on each floor.

LIGHTING SYSTEM

Garage lighting to be high pressure sodium, weatherproof fixtures ceiling mounted with guards to provide 10 footcandles along the driving lanes and 5 footcandles along the parking lanes. The total lighting load shall not exceed .25 watts per square foot.

POWER SYSTEM

Disconnect switches to be furnished, installed and connected. Motor controllers, starters and combination starter/switches shall be furnished and installed by the respective sub-contractor as part of the complete system.

Power wiring for equipment furnished by others to be included under this division. All control system wiring and components will be by their respective contractors.

OUTLETS

Maintenance outlets to be provided in lobbies and parking areas.

TELEPHONE SYSTEM

Telephone outlets to be provided in office areas with conduits and sleeves to the telephone service area.

The telephone service will be underground from the N.E.T. Company manhole. 4" conduit.

FIRE ALARM SYSTEM

Provide an electrically operated, zoned, class "A", double supervised, closed circuit fire alarm system with battery stand-by. Equipment shall consist of a control unit, manual stations, alarm signals, heat and smoke detectors, fan shutdown, sprinkler connections, elevator selective operation, telephone speaker system, master box and connection to the City system.

FINISH SCHEDULE

SPACE	FLOOR	BASE	WALLS	CEILING	NOTES
RESIDENCES					
Living Room	Carpet	Vinyl	DW/Ptd	DW/Ptd	
Bed Room	Carpet	Vinyl	DW/Ptd	DW/Ptd	
Passage	Carpet	Vinyl	DW/Ptd	DW/Ptd	
Bath	Cer Tile	CerTile	Cer/Tile	DW/Ptd	
Corridors	Carpet	Vinyl	VWC	AcTile	
Stairs	Vinyl	Vinyl	VWC	DW/Ptd	
Lobby	Vinyl	Vinyl	Vinyl	AcTile	
Recreation	Carpet	Vinyl	DW/Ptd	AcTile	
Lounge	Carpet	Vinyl	DW/Ptd	AcTile	
Service Areas	Conc	Vinyl	MB/Ptd	Conc/Ptd	
PARKING					
Stairs	Conc	Vinyl	MB/Ptd	Conc/Ptd	
Parking	Conc	- -	MB/Ptd	Conc	
COMMERCIAL					
Toilets	CerTile	CerTile	CerTile	DW/Ptd	
Other Areas	Conc	- - -	MB/Glass	- - -	

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